Philosophy and Science

CRISIS & CRITIQUE

VOLUME 5/ISSUE 1, 2018
ISSN 2311-5475

Dialectical Materialism Collective

CRISIS & CRITIQUE

PHILOSOPHY AND SCIENCE

CRISIS & CRITIQUE
Volume 5, Issue 1, 20178
ISSN 2311-5475

Introduction: Introduction: Philosophy and Science

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Philosophy from its very beginning and throughout its history has had an intimate and close, an immanent as well as an external relationship to science. It was at the same time a singular kind of relation that proves immediately quite incomparable to the relations philosophy entertained with other forms of practice, for example with art or politics. But the relation between philosophy and science also proved to be as complicated and intricate in nature as all of the other ones were.

A symptomatic expression of its inherent problematicity can be read in some of the questions that emerged repeatedly within philosophy: Can philosophy only defend and affirm itself by becoming a science? Does it need a pledge of scientificity so that it would be equipped with a proper measure to evaluate its own practice? Does it need it in order to be able to distinguish between real philosophy and mere sophistry? Or does it need it to even have a clue about how to immanently distinguish between consistent and inconsistent assumptions and arguments? The question whether philosophy must and cannot be but metaphysics and the connected (somewhat Kantian) question if metaphysics can ever take the proper form of a science is one way of phrasing these concerns. The way out of these alternatives into non-metaphysical thinking was also often paved with scientific bricks.

However, is it evident that philosophy can or even must obey scientific standards, measures, measurements? Is philosophy a science, just a peculiar one? And does this mean that a general theory of science - which thus would not be philosophical in nature - would also entail an account of the role of philosophy in an overall system of science, or would philosophy simply be excluded? What role could it play? These questions still haunt ever growing parts of today's academia in the humanities, where one constantly must be on the scout for new criteria of how to prove the scientific excellence and quantifiable quality of one's research.

But in the history of philosophy thus far, the question about the possible or desired scientificity was not brought about externally. It was either raised by philosophers themselves, frustrated by and bored with the endless speculations and, even worse, fabulations of previous philosophers. Again, the only way out seemed to lie in transforming philosophy into a science of a singular kind. But the question of, or rather, concern with, philosophy's scientific status was also raised by scientists outside of philosophy. For, does it have any value for a scientist to engage and think about philosophy, if it falls outside the realm of the sciences? This may seem to be a purely external criticism of philosophy as such. Yet, the dilemma is more profound. For, if philosophy aspired sometimes to be or become a science, the paradigm of scientificity obviously did not come from philosophy, but from the actual existing

sciences, for a long period of time from mathematics. So, philosophy's scientific standard, if there is one, according to such a view, originated outside of philosophy but determines philosophy's own practice. Philosophy is a science if it is like mathematics...only a little different.

But things get more complicated. Plato already famously stated that no one should be allowed to enter the just city who is not a geometer. For today's eyes and ears this may read and sound odd,—even though mathematics is globally taught in more schools than philosophy is—Plato's point was not simply that mathematics provides philosophy with a measure of its own practice. Rather, Plato's point was that scientific education is an education in thinking. Science thinks. And as by thinking one is able to access and bring about truths, the scientific education is absolutely crucial. Not only crucial for the practice of science, nor for the practices of science and philosophy, but also for politics. For, truth is not something individual but constitutively collective: what is true, cannot simply be true for me; it is not up for debate and it is not an opinion. Through mathematics we get acquainted with the very workings of truth, since a mathematical proof is not up for debate and it does not matter if we like it or not – it thus escapes the realm of opinions. To be equipped with experiences of such a practice was for Plato thus crucial for engaging in other, collective practices like politics. In short, no one should be allowed to do collective politics who has not previously experienced what it means to think. And this is inter alia an experience that is generated by science - because we only understand a mathematical proof if we basically could do it ourselves. In Plato's case, we encounter a philosopher who emphasizes the need for being engaged in scientific practice not for the sake of philosophy but for the sake of politics (and thus for the sake of justice). So, for Plato at least, it seems to be possible that philosophy does not need to become a full-blown science throughout, but it almost certainly needs an appropriate concept of science to be philosophy at all—otherwise it could not declare what the precondition of a proper collective , i.e. just politics, is.

In this sense it may come as no surprise that, according to some accounts, the very emergence of mathematics proved to be a constitutive reason for the emergence of philosophy itself; according to others, as we already highlighted, the history of philosophy is fundamentally made of nothing but the (failed or, at least, repeated) attempts to constitute itself as a science in its own right - one may here think of Kant, in a different manner of Hegel, certainly of Husserl, or even of Marx and certain branches of Marxism. One proponent of such orientation in Marxism is clearly Louis Althusser, who went as far as to grant *historical materialism* the status of science, equal to the scientific discoveries of mathematics and physics.

But, recently, a new phenomenon is emerging among some scientists. Stephen Hawking declared philosophy to be dead, precisely because it couldn't keep up with the developments of modern science, and particularly with those of modern physics. Accordingly, scientists have now become the partisans of discoveries, and therefore of new forms of knowledge, thus leaving philosophers behind, without any useful role to play. This position might be not entirely new. In the history of philosophy, we also find positions that are on the other side of the Hawking's coin. While Hawking is the scientific enemy of philosophy, in the history of philosophy we have philosophical enemies of science. The most notable example is perhaps Heidegger. He was primarily concerned with physics and perhaps it was physics what he meant when he referred to "science." For Heidegger, ever since modernity, knowledge begins by thinking the concepts, rather than by empirical observations. He argues that although nature is a subject to scientific observation, it nonetheless exists in itself, that is to say, it is inaccessible to sciences. His position *a propos* sciences is best epitomized in his thesis "science does not think." There is a contradiction, for Heidegger, between its foundation and its meaning. Science cannot account for the reasons of its foundation and cannot give meaning to its existence. To quote Heidegger: "Using physical methods, for example, I cannot say what physics is. What physics is, can only be thought following the manner of the philosophical question." Which is why it is ultimately the paradigm of something else, namely technology, that came over mankind since Plato and increasingly not only taints but brings into oblivion our proper understanding of nature, that is physics, that is being. Science is essentially technological, and as all technology works as a formation of the object so that the subject can appropriate it and use it as it likes. Science is essentially at the basis not only of our *hybris*, but of the hidden metaphysical core that drives the totality of the western world almost from its forgotten origins on.

There is also another way of opposing science from within philosophy, that of critical theory, maybe in this sense best epitomized in Adorno's philosophy. Since, for this strand of thought, science is one of the ultimate expressions of the very economic and political forces that drive a capitalist society. That is to say: science is essentially capitalist—a judgment that comes quite close to that of Heidegger. There is—different from what Althusser believed—no residue of thought in science. It is purely instrumental and all philosophy engaging with the sciences is therefore *a priori* positivist, in the worst of its political meanings.

The present issue of *Crisis and Critique*, as now many thinkers have done before it, assumes that the times for any overall condemnation of science are over. Yet, the dangers of positivism might re-emerge in a fundamentally new disguise, and thus it is of conceptual, but also of political importance, to investigate the relation between philosophy and science. This relation, as we argued, is not reducible to the possibility of measuring the former by the standards of the latter, or vice versa. Rather, it is precisely the category of measure – which one is the measure of the other? – that may articulate the difficulty at hand, namely is philosophy determined by science or the other way around? and if so, how may we conceive this determination (is it one "in the last instance", as Althusser's expression goes)? The very relation between philosophy and science – if there is one at all – raises profound questions about the practice of both, such as: What is the material status and what are the material effects of scientific knowledge for philosophy? Does philosophy need to integrate, attain, mimic science, its proceedings, and its knowledge in its very own practice? Is science about knowledge after all? And would science, not of knowledge, but of truth, just be another name for philosophy? There are obviously many more questions concerning the concatenation of philosophy and science if one additionally takes into account the current historical conjuncture. For, what is the status of science in capitalism? Is science a necessary instrument and even a precursor for the reproduction and intensified circulation of capital (which may determine the contemporary – emancipatory or regressive, or both – role and function of technology)? Or, what precisely could be the emancipatory, maybe even political potential of science (for example, in terms of the critique of ideology or as that which creates knowledge about ourselves)? Is there a paradigmatic science that philosophy has to be confronted with (mathematics, biology, quantum-physics, to name just a few candidates discussed within the most recent times)?

The present issue of *Crisis and Critique* brought together some of the most influential thinkers who work on the topics we are addressing in this issue. We are fully aware that by this we are being neither comprehensive, nor exhausting the topic. Our aim is to bring together thinkers and philosophers from different orientations, who are preoccupied with the relation, influences, overlapping, mutual determinations, and multiple effects that occur between philosophy and science.

Berlin/Prishtina, March 2018

Rethinking a Philosophical Way of Demarcating Science from Politics

Sina Badiei

Abstract: Ever since the Kantian turn in philosophy, if not already in Plato, Aristotle, Descartes, or Spinoza, there have been a large number of attempts at thinking the relationship between science and politics. Many of these attempts have been reductionist, in that they have tried to reduce one of the two to the other, or else have tried to think of them as different but have then posited their unity at a more fundamental level. The precise nature of explaining this reductionism has varied significantly, going from very simple cause and effect relationship to more complex forms of causal interaction between the two. For reasons that will be discussed at length in this article, a criticism of a number of such approaches will be proposed. It will be argued that trying to come up with a satisfying way of demarcating science from politics is a more pertinent philosophical undertaking. Rethinking the demarcation problem necessitates, nonetheless, that we take into account the previous philosophical attempts that have embarked on such a path, thereby clarifying the way in which this new philosophical way of thinking the demarcation problem contrasts with these previous attempts.

Keywords: Science, Politics, Political Economy, Demarcation Problem, Popper, Badiou

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1. Introduction:

The relationship between science[1], politics[2], and philosophy is an utterly complex one. If we can find important reflections on this question already in Plato, Aristotle, Descartes, Spinoza, and many others, it is since the Kantian project of thinking the different parts of what he called the human reason that this question has been thought in a more systematic

1 It should be made clear from the beginning that the word science in this text, especially when it is about elaborating the way in which it differs from politics, signifies natural sciences, that is physics, chemistry and the life sciences, even if in certain parts of the text it can also signify mathematics.

2 In this text, by politics I mean to designate the domain which comprises the political and the economical relationships or interactions between human individuals. Marx's insistence on the complex, intertwined, nature of political and economical relationships is something with which I completely concur. I tend to think, nonetheless, that the biggest shortcoming of Marxism is its failure to clarify the precise nature of this entanglement. This has to do, to my mind, with Marx's strange way of conceiving the nature of human needs, where he argues that there is essentially no difference between the so called natural needs and the so called historical needs, going as far as saying that all human needs are essentially historical (see, for example, Marx 1990, p. 275 and Marx 1902, pp. 42-43). I would argue that in so far as the four fundamental natural (or physiological) needs - that is to eat, to drink, to have a dignified shelter, and to have access to proper health care -, are not unconditionally satisfied for all the inhabitants of the earth, it is impossible to think of the political and the economical relationships as separate. It is only the political nature of the economical relationships that can explain why a country such as the Democratic Republic of the Congo, one of the richest - if not the richest -, on earth in terms of its natural resources, is at the same time one of the poorest - If not the poorest -, in terms of its GDP per head. In addition, the proper loci of such politico-economical relationships are the different State apparatuses, but also the different political organizations that exist across the world.

way. It can be argued that, at least in the past two centuries, this relationship has been thought in essentially four different manners:

1. Trying to show that the problems of political thought and practice are mostly the result of the failure to grasp politics in a scientific fashion, and that constituting politics as a science, that is a kind of political science, is the only way to go beyond many futile debates and struggles in politics.
2. Trying to show how science and scientific practices are ultimately reducible to political issues that underlie them and that beneath the apparent autonomy of scientific practices we can find political struggles that determine them.
3. Trying to find a more fundamental, more essential level to which both politics and science are reducible, and showing that politics and science, even if apparently different, are nonetheless the different expressions of a same essential reality.
4. Trying to demarcate science from politics, that is thinking of them as two different practices, and finding satisfactory criteria in order to support and justify this distinction.

The first position was very dominant in the Enlightenment era. In the 19th century, there were many attempts at forging a science of politics, but it was Marx's critique of political economy that constituted the most serious endeavor to come up with a scientific way of understanding political action. In the 20th century and still today, much of modern neoclassical economics has been influenced by such an outlook. Especially since the second half of the 20th century, this position has embraced a naturalistic form of reductionism, that is, not only it has tried to reduce politics to science, it has, moreover, tried to constitute this political science along the methodological and epistemological lines of modern physics.

The second position has become prevalent especially since the breakout of the First World War and reached its climax in the aftermath of the Second World War and the destruction that the latter wrought[3]. The systematic use of science in developing advanced warfare has shown that science, far from showing the path towards a so called rational politics, can be complicit in the most obscurantist forms of politics, and can be used to bring about on earth not paradise, but hell. The Cold War and its military requirements did nothing but accentuate the systematic

3 Many authors in social constructionism have embraced this position. It can be equally found in Habermas 1968.

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integration of different scientific practices within the existing forms of political regimes, and led to the increasing militarization of scientific research. This subjugation of science to politics has reached such levels that it has led some of the greatest scientists to break ranks with the scientific world, and to rise up against such political misuses of science. Alexander Grothendieck is the most prominent example of such scientists. Even among physicists, there have been many victims of this political mishandling of science. David Bohm is the most revealing example of such physicists[4] [5]. He used to be, in his youth, a member of a number of Communist political organizations in the United States, but he later on stopped his political activism and focused on physics. But the arrival of McCarthyism in the US would not have let him get away with it, they first put him in jail and then fired him from Institute for Advanced Studies at Princeton, where he had been an associate of Einstein. After he was fired, Einstein, who considered Bohm to be one of the best physicists of his generation, did his best to help him find another position, but to no avail. No American university would accept to recruit him. This then led him to renounce his American citizenship and to find a university position first in Brazil, then in Israel and finally at the Birkbeck College in the UK, which had become, at the time, the bastion of American academic exiles in Europe. It is during this period that he developed an alternative, realist, interpretation of Quantum Mechanics[6].

The third position was especially widespread in the 19th century but has continued to be very influential ever since, even if it has taken very different forms. In the 19th century, Hegel tried to show that his philosophical Idealism was operating not only in the political sphere of the State, but also in the scientific sphere. The second part of his *Encyclopedia of the Philosophical Sciences* deals with the philosophy of nature and he tries to show there how his dialectical way of conceiving the workings of history is also pertinent to the understanding of the workings of modern science. In the 20th century, and especially since the creation of the sociology of knowledge by Karl Mannheim, sociologists have tried to show how a sociological understanding can let us have an overarching grasp of the workings of the social totality, and the different practices - such as political or scientific ones -, that are effectuated within it.

4 Freire. Jr 2005.

5 Olwell 1993.

6 The most satisfactory version of this realist Quantum Mechanics can be found in Bohm et al. 1993 and Dürr et al. 2009.

Finally yet importantly, a number of thinkers, especially in the 20th century, have reacted to the third position by trying to come up with satisfactory ways of demarcating science from politics. It is true that such attempts, contrary to the first three positions, have rarely constituted schools of thought. This, I think, is mostly related to the fact that demarcating science from politics, that is refusing to reduce one to the other, or reducing the two to a unity constituted at a different level, requires a kind of engagement with the two practices that is not easy to sustain. Demarcating politics from science means rendering justice to the proper specificity and singularity of each of them. It is only by grasping each practice in its own terms, and refusing to think it in the light of other practices, that one may appreciate the way in which it differs from the other. Without meaning to belittle the significant works effectuated in this direction by the neo-Kantian school and the French tradition of historical epistemology, it seems to me that Karl Popper's *Open Society and its Enemies* and Alain Badiou's *Being and Event* constitute, even if very differently, the most serious attempts at thinking the demarcation problem. One should not forget that Morris Raphael Cohen's *Reason and Nature* and Jean Paul Sartre's *Critique of Dialectical Reason* are also very important works. However, Cohen does not really try to demarcate science from politics, but rather science from that which is not reducible to science. As for Sartre, he simply assumes the difference to exist, without trying to propose satisfactory criteria to justify it. He thus contents himself with putting forward a model for thinking human action that is not reducible to the models of what he calls positive sciences, without ever clarifying what he really means by the latter.

In what follows, I will propose a brief criticism of the first three positions, before turning to the gist of this article, which is an attempt at rethinking the demarcation problem.

2. Politico-Economical Science:

Constituting political analysis as a science has taken, historically, two principal forms. The first one has encompassed all those who have tried to think of scientific methodology as unique, and who have often taken physics as their model of scientificity, and have then tried to constitute their scientific models by following naturalistic or physicist modes of

thinking. Robert Nelson[7] and Phillip Mirowski[8] have shown how some of the most influential economists in the 20th century, such as Paul Samuelson and John Maynard Keynes, took physics as their model of genuine scientificity. Keynes, for example, went as far as borrowing the title of his main book, *The General Theory of Employment, Interest and Money,* from Einstein's General Theory of Relativity[9]. Still, Milton Friedman's *Essays in Positive Economics* has probably been the most influential among those with this tendency[10].

Friedman begins his book by introducing the distinction put forward by John Neville Keynes[11] between a positive science, which deals with what is, and a normative science, which deals with what ought to be. He then goes on to argue that in economics, these two different dimensions, positive and normative, can be easily distinguished, adding that it is not that much the positive aspect that depends on the normative aspect, but "normative economics and the art of economics, on the other hand, cannot be independent of positive economics. Any policy conclusion necessarily rests on a prediction about the consequences of doing one thing rather than another, a prediction that must be based – implicitly or explicitly- on positive economics"[12]. He then tries to reduce economics to its positive dimension by arguing that "currently in the Western world, and especially in the United States, differences about economic policy among disinterested citizens derive predominantly from different predictions about the economic consequences of taking action – differences that in principle can be eliminated by the progress of positive economics – rather than from fundamental differences in basic values, differences about which men can ultimately only fight"[13]. As we can see, we are dealing here with an epistemology that contends that most infighting in politics is the result of the failure to understand scientifically the consequences of political actions. But the specificity

7 Nelson 2001.

8 Mirowski 1989.

9 Nelson 2001, p. 32.

10 It was the unfathomable influence of this book, and Hayek's anti-scientist outlook, that pushed the latter, otherwise Friedman's liberal bedfellow, into saying that "You know, one of the things I often have publicly said is that one of the things I most regret is not having returned to a criticism of Keynes's treatise, but it is as much true of not having criticized Milton's [Essays in] Positive Economics, which in a way is quite as dangerous a book."

11 Keynes 1999.

12 Friedman 1953, p. 5.

13 Ibid.

of the Friedmanian approach is that it is, as I said, naturalist, in that he thinks that "positive economics is, or can be, an "objective" science, in precisely the same sense as any of the physical sciences"[14]. I will deal with Friedman's epistemology in the section that deals with the demarcation problem, because this type of naturalistic epistemology represents, nowadays, the dominant form of thinking the relationship between science and politics, at least in the academic milieus. As such, it constitutes the biggest challenge for any rethinking of the demarcation problem.

The second form of constituting political analysis as a science has consisted of all those who have tried to come up with scientific models that no longer follow the epistemological and methodological rules of the natural sciences, but their own independent rules. Marx's critique of political economy and Ludwig von Mises' a-priori science of human action are, in my opinion, the most significant examples of such efforts, even if, it is true, the historicist epistemology of Marx and the aprioristic epistemology of von Mises are nowadays rather marginalized in the academic politico-economical circles.

Popper's critique of Marx's historicism[15] is very well known, even if most of those who have either defended or criticized his take on historicism have only read his rather superficial account of historicism in his *Poverty of Historicism*[16]. Still, even if his criticism of Marx's historicism put forward in *Open Society and its Enemies* is far more convincing, it remains true that his reading of Marx has many shortcomings. This does not mean, nonetheless, that Marx's epistemology is not fundamentally historicist: many of the most important steps in Marx's critique of political economy will not function if one does not invoke, repeatedly, what he calls the historical tendencies at work in the object of his analysis, tendencies that are not proved but rather assumed.

Not only Marx's critique of political economy is constructed so as to substantiate the law, very historicist, of the falling rate of profit, which he deemed "in every respect the most important law of modem political economy"[17], his most fundamental premise, that of abstract labor being

14 Ibid, p. 4.

15 Popper 2013, pp. 311-320.

16 It is easy to show how much this book has influenced Friedman's *Essays in Positive Economics*. Surprisingly though, Popper's *Open Society and its Enemies* is very critical towards naturalistic attitudes in politics, whereas his *Poverty of Historicism* is, to say the least, very ambiguous in this regard. There is very little in Popper's *Open Society and its Enemies* that could possibly prop up the naturalist epistemology of Friedman.

17 Marx 1993, p. 748.

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the substance of value, is not thinkable outside of a non-historicist framework. For otherwise his way of conceiving the relationship between the so-called simple abstract labor, and the so-called skilled complex labor cannot stand to a critical scrutiny. The only satisfactory way of evading the problem is by saying that the historical tendencies of capitalism will push it towards a future in which different forms of labor, especially its skilled and complex forms, will be transformed into simple abstract ones[18]. This is one of the main reasons why Marx thought that it is only with the advent of the real subsumption of labor under capital that capitalism proper (or what he calls the specifically capitalist form of production[19]) begins. It is true that the development of industrial capitalism has reduced many previously complex and skilled forms of labors to simple manual forms of labor undertaken within factories. But this transformation has been accompanied by the emergence of a whole new series of skilled and complex labor, especially in the engineering and design sectors, forms of labor that are far from being reducible to simple and abstract labor. Consequently, today as in the 19th century, those who want to believe in the truth of Marx's analysis can only do so by having recourse to historicist epistemology and saying that in the future, these newer forms of complex skilled labor will themselves be reduced to simple abstract labor without newer forms of complex skilled labor being created!

What we should nonetheless keep in mind is that Marx's espousal of historicist epistemology was the result of specific circumstances in his life and that before finding himself in total isolation in London, he had not championed such an epistemology:

> If the isolation of the early 1850s sealed their [Marx and Engels} partnership, it also transformed Marx's thinking about the onset of revolution. Belief in an imminent revolutionary upheaval, one in which he could play an influential role, was increasingly difficult to maintain, given the ever greater strength of political reaction in continental Europe and Marx's beleaguered position among the political exiles. It was then that Marx developed the idea that a revolution would occur in the wake of a cyclical capitalist economic crisis. Since this idea has appeared throughout the twentieth century and into the twenty-first as the quintessence of Marxism, it may be surprising to realize that Marx himself had not always advanced it. The Communist Manifesto, for instance, discussed

18 Harvey 2006, pp. 60-61.

19 Marx 1990, p. 1024.

economic crises and the workers' revolution, but did not assert that one was the origin and precondition of the other. Marx's plans for reviving the 1848 Revolution, as counterrevolutionary forces gained the upper hand, turned on a new working-class uprising in France and the revolutionary government emerging from it becoming involved in a great war against the counterrevolutionary powers. As late as the spring of 1850, he was continuing to think along those lines.

In the last issue of The New Rhineland News: Review of Political Economy, written after Marx's political and personal isolation had become complete, he first developed an explicit connection between economic crisis and revolutionary upheaval. A revolution would only be possible "when both factors, the modern forces of production and the bourgeois form of production come into contradiction with each other." Until this happened, "the manifold petty strife of the different elements of the continental party of order," as well as the "moral outrage and the enthusiastic proclamations of the democrats," would have no effect. "A new revolution is only possibly in the wake of a new crisis.[20]

If Marx's underlying epistemology is historicist, that of von Mises is, as already indicated, aprioristic[21]. The a-priori science of human action, or praxeology, is, according to von Mises, a science that tries to think through the very form, or logic, of human action. He defines human action as the conscious behavior of human beings, and which should be distinguished from their unconscious behavior. The ultimate goal of an action is to ameliorate a state of dissatisfaction in which the actor may find himself or herself. His theory tries, therefore, to give us the formal framework for the understanding of all action that tries to reduce dissatisfaction and pain and to increase satisfaction and pleasure[22]. Now the precise contents of such actions may well be very different from one actor to the other, the theory does not say anything regarding the content of actions[23]. For example, the theory is perfectly compatible with the fact that for one person, it is aiding others that may increase his or her satisfaction and pleasure, whereas for another person it may be the accumulation of so many material objects. He therefore accepts

20 Sperber 2014, pp. 273-274.

21 Von Mises 2014, p. 7.

22 Ibid, pp. 23-24.

23 Ibid, p. 152.

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that people have very different value systems, but he thinks that at a formal level, they are not different. All action that satisfies such criteria (reduction of pain and enlargement of satisfaction) is for von Mises an economical action. However, economics as a science can only deal with actions about which a monetary calculation is possible[24]. Such a formal framework of thinking human action permits the actions of different actors, which are otherwise different contentwise, to be articulated together.

The interesting point about von Mises' model is that it is not compatible with any prediction in the mathematical sense[25]. For him, to be able to predict in such a way one should know not only the formal logic of human action, but also the precise contents of each individual's value judgments, something that he considers impossible. The main function of his theory is to let us understand the degree of compatibility of different politico-economical structures with the logical structure of human action, and he thinks that among those structures that have hitherto existed, the market economy, with its price mechanism, is the only one that is compatible with the general teachings of his theory.

In spite of the very insightful character of many of his observations, the a-priori and ahistorical epistemology of his theory is not satisfactory. We know, ever since the breakdown of the Kantian synthetic a-priori reasoning, that the so-called a-priori arguments are nothing but the forms of reasoning prevalent in an epoch. The a-priori parts of Kant's philosophy were nothing but formal statements deduced from Newtonian physics and Euclidean geometry - often thought of, at the time, as the definitive forms of physics and geometry -, and their validity could not go beyond the validity of these sciences. When geometry and physics were revolutionized in the 19th and 20th centuries, we noticed that Kant's a-priori statements had nothing a-priori about them, and that they were simply a-posteriori thoughts, derived from the sciences of his time, retrospectively a-priori-zed.

Kant's a-priori reasoning was an attempt to respond to Hume's skeptical remark concerning the fact that even if an object has always behaved in a certain way, it cannot be excluded that it would behave differently in the future[26]. Hume's way of conceiving our relationship to objects was therefore giving too much autonomy to the latter, in that it was giving them the possibility of changing their behavior in the future. This autonomy would have rendered any eternal knowledge of objects

24 Ibid, pp. 158-160.

25 Ibid, p. 116.

26 Hume 1993, p. 131.

impossible. By arguing that our knowledge of objects is always mediated by transcendental, a-priori, categories and perceptive forms (space and time) which are subjective, and by further arguing that these categories are eternal and unchangeable, Kant found a convincing way to decouple our knowledge of objects from the unsettling autonomy that Hume had attributed to them. Our knowledge became, therefore, completely dependent on us and on our subjective constitution and much less on objects and their autonomy. And given that Kant's transcendental apparatus had been developed largely based on Newtonian physics and Euclidean geometry, his manner of theorizing our knowledge and the latter's relationship to objects remained convincing in so far as these two branches of science had not been challenged by newer forms of scientific knowledge.

However, as already mentioned, Newtonian physics and Euclidean geometry proved, later on, incapable of exhausting the range of behavior of which natural objects are capable. It is true that post-Newtonian physics and non-Euclidean geometries show that natural objects behave, often, according to typical and regular patterns, but these patterns differ radically from those that had been attributed to objects in the past by Newtonian physics and Euclidean geometry. With the failure of these past sciences to capture all the behavioral patterns of natural objects came the breakdown of the Kantian aprioristic apparatus that was dependent on them. Even if post-Kantian philosophers have been trying ever since to renovate the Kantian mode of thinking by building transcendental apparatuses based on newer forms of mathematics and physics, one thing remains certain: Kant's own a-priori reasoning was not a-priori but structured by the sciences of his time.

In a similar fashion, those aspects of Mises' science of human action that are valid are not so in an a-priori fashion, but merely based on the structure of the human relationships of his time and those times on which he had reflected. It is true that von Mises' theory is compatible with the possibility of historical change, given that he indicates that his theory is about the formal logic of human action, and not its contents, and that, for him, it is precisely these contents that can explain why human action changes from one epoch to the other. However, separating the form and the content of human action is not as straightforward as von Mises presents it. Even in terms of our understanding of the natural phenomena, the emergence of new mathematics and new physics did not simply bring about new sciences with new contents; they also made us think very differently the very form of our scientific reasoning. Our very understanding of space, time, locality, and causality has changed after the advent of non-Euclidean geometries, Quantum Mechanics and General Relativity. As such, if his theory of human action is merely about

saying that the goal of an action is to always augment one's satisfaction, and to reduce one's dissatisfaction, then this is of course satisfactory, but presenting this as a science is as satisfactory as a natural science that would seek to merely inform us that, formally speaking, natural science is about representing nature!

3. Science is Political:

I have already mentioned, briefly, the reasons why thinking of science as ultimately political is so widespread. The fact that political and economical motives determine the contours of many scientific projects (especially in terms of their funding), and that much of scientific research is conducted with the goal of furthering the economical and political power of this or that enterprise, or this or that country, is rather obvious[27][28]. It is, nonetheless, important that we resist a number of issues that are mixed up in all these talks about the essentially political nature of science. One is that science being itself political is different from science being used politically. For example, Grothendieck stopped most of his mathematical works not because he thought that they were eminently political, but because he became aware of the military use that had been made of his theories, even if he had done his best to work on mathematical theories that would be useless from an instrumentalist point of view.

David Bohm, as someone who had severely suffered from the politics of his time, did not stop believing in the possibility of doing non-politically motivated science. He even thought that the fight against instrumentalist science should be effectuated from within science itself. This is why he spent so much time to come up with a new Quantum Mechanics capable of justifying itself on purely scientific grounds, and not on the technological advances to which it could have given birth. The dominant form of Quantum Mechanics, the so-called Copenhagen interpretation, embodies, on the contrary, a very utilitarian form of doing science. Most of the misunderstandings and phantasmagoric ideas associated with Quantum Mechanics are related to the instrumentalist character of the latter. Instead of trying to spend more time on the conceptual aspects of their theories in order to come up with a more satisfactory version of Quantum Mechanics, the physicists who have been working on this interpretation, especially its founders, have put forward ideas which seem very profound but which are deeply obscure[29].

27 Werskey 2007.

28 Wang 1999, p. 278.

29 Bell 2004, p. 160.

These obscure ideas have then discouraged many physicists from spending time on the foundational issues in physics, thinking of them as ultimately useless, and have made them think that physics is mostly about coming up with better results. However, if the conceptual and foundational dimension of physics is not part of these results, and if the better results do not give us a better understanding of the physical nature, then the only way left to explain why newer physical theories are better than the older ones is to say that they are better because they work better, and by working better we can only mean that they let us build better instruments, better tools. The main criterion for judging physical theories will then come from without physics itself. And this way of thinking physics, conjugated with the military requirements of the Second World War, and then the Cold War, but also the productivist nature of the materialistic liberal order, have led to the emergence of practices in physics whose ultimate goals and ideals are no longer set by physics itself, but by politico-economical motives.

In thinking, even lamenting, what has happened to much of scientific research in the past decades one needs to, nevertheless, be very clear as to what we can possibly expect from a pure, non politicized science. Everything depends on what those who talk about the political nature of science mean when they talk about politics. Already when we talk about politics, we can mean two very different things; we can mean, of course, those actions, undertaken by those in power, which aim at nothing but furthering the proper limited interest of their actors, and that in the most sinister way. Politics in this sense is a synonym for opportunism, charlatanism and oligarchy. However, politics does also have a second sense, it designates the action of those who are disgusted by the unjust nature of the existing political establishments, and the corrupted nature of the existing political and economical relationships between individuals. Such a politics is not about furthering the limited interest of those who undertake them, but about creating new relationships between individuals motivated by the idea of justice, that is, relationships capable of being the common creation of all participants, and not the exclusive, free, creation of the most opportunist ones.

Now those for whom politics has only one meaning, that is its first, they are cynics for whom nothing changes under the sun. The nihilistic outlook of such commentators refuses to accept that an action could be motivated by anything other than vile and corrupted interest. Given that this nihilistic outlook is incapable of recognizing any distinction between any action and any other, it is obvious that insofar as we dwell within this outlook there is no possibility of thinking any distinction whatsoever between science and politics.

This means that our critical interrogation of this second position

should be mainly concerned with those who do think that politics itself is, or at least can be, divided into two fundamentally different forms of action, and who nonetheless think that scientific action is always politically motivated. Now when it comes to politics, those who share the latter view would indeed agree that the different, justice-oriented, form of politics that they advocate represents, quantitatively, an absolute minority of the totality of actions that we often characterize as political. Still, this does not lead them to fall into the nihilist trap, by accepting that politics is reducible to its unjust forms. If they then accept that politics, in its emancipatory sense, represents a minority of actions that are thought of as political, why do they think that things should be any different when it comes to science? In other words, the fact that the majority of scientific practices are nowadays oriented towards goals that are fixed by reprehensible politico-economical agendas does not mean that science is reducible to such practices. As with politics, when we are trying to think of science as an autonomous and noble action, we have to accept that such scientific practices represent the minority of practices that are thought of as scientific. It would therefore be unfair to expect from science something that we cannot expect from politics itself. In other words, in the same way that politics designates at least two different forms of action, we should accept that science, too, designates two different forms of practices, those that are reducible to politico-economical motives, and those that are not!

4. Science and Politics as Different Expressions of One, Essentially Unique, Reality:

The final position that I will criticize before turning to the main topic of this article, which is rethinking the demarcation problem, is the position that I have already presented and which consists of accepting science and politics as different at the immediate empirical level but then dissolving their difference at another level. Hegel's philosophical Idealism and sociological thought, especially ever since Karl Mannheim put forward his sociology of knowledge, constitute two significant examples of this position.

Regarding Hegel's philosophical unification of science and politics, it is widely accepted, nowadays, that his attempt at explaining the natural sciences of his time according to his dialectical way of proceeding is not convincing. The problem with Hegel is that he remains, when it comes to science, attached to the essence/appearance form of epistemology. This way of understanding science was very characteristic of the Aristotelian scientific epistemology. However, modern mathematized science has precisely consisted of breaking loose from this Aristotelian framework.

Modern physics is therefore not about getting behind the appearances to get to the essential reality[30], it is rather about finding typical patterns in the world of appearance and mathematical models provide us the easiest way to describe such typical or regular patterns. The fact that there are different patterns in nature, and that not everything in nature behaves necessarily according to typical or regular patterns, is the reason why we cannot observe many of these patterns on the spot. Many of these typical patterns are difficult to observe because of the effect of other patterns, or because of the distorting influence of elements in nature that do not behave according to any such patterns. Science is therefore about proposing hypotheses regarding the existence of this or that regular pattern in nature, and coming up with experimental settings in which the distorting effects of all unrelated natural elements are abstracted from, in order to highlight the real existence of the typical pattern put forward by the hypothesis. Given the role played by experiments in modern natural science, it should be clear that science is not about gaining access to an essential, behind the scene kind of reality, because the experiments that we perform deal, always, with immediately observable appearances, even if to observe them we have to use specific instruments.

Moreover, that in every scientific theory we always deal with two sorts of data, the typical patterns that are postulated, hypothetically, by the theory (that we sometimes call natural laws), and the initial condition of the object or setting under study, is totally overlooked by Hegel. The initial condition of any object that is being studied scientifically is a simple contingent given, we cannot explain scientifically why it is given or why it is there, it is simply there because it is there, and the role of science is to explain how such an initial condition is then transformed under the influence of the natural laws. Even if we manage to explain the present initial condition of an object by referring to the previous effect of the natural laws, we then have to explain the givenness of the previous initial condition. And if we continue in this way, we notice that in the end, we get to an irreducible givenness whose presence is wholly contingent, which means that it cannot be subsumed under any necessity-oriented theorizing.

The sociological approach to politics and science is not fundamentally different from the Hegelian approach. If in Hegel, it is philosophical Idealism that is used to unify science and politics, in the sociological approaches the social totality is used to bring about this unification. In such an outlook, science and politics are thought of as

30 Saying that the appearance, in Hegel, has a necessary relationship with the essence - which therefore prevents it from being reducible to a mere accidental and insignificant semblance -, would not change the fact that the epistemology of modern mathematized science has broken ranks with the essence/appearance epistemology.

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two different social practices, whose different logics can be subsumed under the all-encompassing, more fundamental social logic discovered by sociology. Initially, it might seem that in the sociological approach, the more fundamental substratum that is put forward is, contrary to the Hegelian Idea, far from abstract, and that it is utterly concrete. At the end of the day, most of us often talk about society and this or that societal fact. Yet, Popper is right to take to task the holist claims of these sociological approaches[31]. Society, if it exists, is an infinitely complex set of utterly heterogeneous actions and haphazard facts about the totality of which no one can say anything sensible[32]. As far as I know, no sociology has ever managed to reduce, successfully, these heterogeneous actions to any set of unifying rules or principles, unless the set put forward contains, itself, so many different irreducible elements.

Now when it comes to the relationship between science and politics, if the more fundamental societal level that is postulated contains, itself, a multiplicity of elements which are not themselves reducible to any set containing but one element, then reducing politics and science to this set does not mean that we would have reduced their apparent difference to a more fundamental unity. This would simply mean that we would have reduced the difference between science and politics to a different form of difference! Sociology does obviously have the right to try to do this.

The sociological approach that I am criticizing in this section is the one that pretends to reduce the difference between science and politics not to another difference, but to a unitary fundamental level. An example of the latter is Mannheim's sociology of knowledge. The unifying principle in Mannheim's sociology is centered on the concept of interest. For Mannheim, very different societal practices are similar in that their actors are unaware of the interests that determine and orient their actions. Mannheim thus credits Marx with having discovered how different actions, and especially how different forms of scientific knowledge, are determined by "the role of class position and class interest in thought"[33]. However, he takes Marx to task for having failed to notice that this is not only true apropos of the so-called bourgeois theoreticians, but equally of the proletarian ones. In other words, he thinks that Marx and Marxists have overlooked the fact that their knowledge, too, is motivated by

31 Popper 1986, pp. 79-80.

32 This means that it is important that we distinguish the politico-economical relationships from the social relationships in general. In other words, we should understand that the latter are not reducible to the politico-economical relationships.

33 Mannheim 1936, p. 66.

unconscious interests. His sociology of knowledge therefore takes for granted that all knowledge and all practices are motivated by interest. We already discussed, in the last section, the cynical way of thinking of science and politics as being the same. Mannheim's position is different in that it pretends that sociologists, or what he calls Intelligentsia, can liberate themselves from the influence of their unconscious, limited, interests. Now we should of course ask how they could manage to do this given that all the others are incapable of it. Here is how Mannheim responds to this question:

> Such an experimental outlook, increasingly sensitive to the dynamic nature of society and to its wholeness, is not likely to be developed by a class occupying a middle position but only by a relatively classless stratum which is not too firmly situated in the social order. [...]This unanchored, *relatively* classless stratum is, to use Alfred Weber's terminology, the "socially unattached intelligentsia". [...] Although they are too differentiated to be regarded as a single class, there is, however, one unifying sociological bond between all groups of intellectuals, namely, education, which binds them together is a striking way. [...] One of the most impressive facts about modern life is that in it, unlike preceding cultures, intellectual activity is not carried on exclusively by a socially rigidly defined class, such as a priesthood, but rather by a social stratum which is to a large degree unattached to any social class and which is recruited from an increasingly inclusive area of social life. [...] There arises, then, in the midst of this society, which is being deeply divided by class cleavages, a stratum, which a sociology oriented solely in terms of class can only slightly comprehend. [...] Although situated between classes it does not form a middle class. Not, of course, that it is suspended in a vacuum into which social interests do not penetrate; on the contrary, it subsumes in itself all those interests with which social life is permeated. [...]Today more than ever it is expected of such a dynamic middle group that it will strive to create a forum outside the party schools in which the perspective of and the interest in the whole is safeguarded.[34]

It is needless to emphasize how Mannheim's view is close to the technocratic apolitical perspective of the welfare state ideology in the 20th century. However, the total disappearance of the communist threat has helped the ruling liberalism to stop giving concessions to the people, even in the moderate form of the welfare state. The aggressive

34 Ibid, pp. 136-144.

privatization of higher education throughout the world is a clear evidence of this. Even if Mannheim's academic intellectualism could seem more reasonable in the heyday of the welfare state, it would be strange to expect such unattached intellectuals to be found in universities that are increasingly inaccessible to those who are not sufficiently rich, or who do not come from the 'appropriate' milieus[35]. Be that as it may, those who are convinced by this manner of justifying the sociological dissolution of a whole series of practices, supposedly marked by diverse unconscious interests, into a sociological understanding characterized by the alleged absence of any such interest can continue to work along the lines introduced by Mannheim and other sociologists who have worked in his wake. Those of us who are not satisfied with this way of thinking the relationship between science and politics have to think the latter differently. This is what I will now turn to.

5. Towards a Philosophy of Demarcation:

When discussing different attempts at founding a science of politics, I emphasized that reconstituting a philosophy of demarcation requires that we come up, especially, with a satisfying criticism of those who have tried to create such a science from the perspective of the naturalistic epistemology. This is important not only because the dominant epistemological outlook in today's academic philosophy, especially in the English-speaking world, is naturalistic, but also because modern neoclassical economics is so far the most serious attempt at realizing a science of politics. As I have already stated, the naturalistic epistemology of Milton Friedman has exerted an undisputable influence on the way researches in neoclassical economics have been conducted. It is therefore by proposing a critique of this epistemology that I will try to delineate the general contours of a philosophy of demarcation.

We have already seen how for Friedman it is positive economics, which should be constructed along the epistemological lines of physics, that should guide political decisions and actions that are normative. What he neglects, however, is that it is not only the "ought to", the normative economics, that depends in such a way on the "is", the positive economics, but that what already is may have depended for its coming to be on some previous "ought to be" which would have been used in order to change the positive economical situation that had preceded it. In other words, in Friedman's reasoning, we are dealing with a positive

35 That people's actions are often determined by different kinds of limited interests, or that there could be a group of people capable of orienting their actions according to a different logic are not what I am criticizing in Mannheim. It is his academic and intellectualist way of conceiving the possibility of going beyond limited interests that I am objecting to.

economics, very similar to physics, to which we may then add a normative aspect separated from it. What he fails to see is that the positive and the normative dimensions may be so much intertwined in the economical relationships that separating them in such a clear cut manner may be impossible.[36] His manner of articulating these two dimensions would have been more acceptable if we were to confine ourselves to our present state of affairs, and if we did not have any historical knowledge whatsoever. But as soon as we try to understand the present situation as a moment in the economical history, we cannot but notice that what "is" today "was not" yesterday, and that what is for Freidman the subject matter of positive economics today was precisely the subject matter, the yearning, of the normative economics of yesteryears.

Friedman's very bold distinction between normative and positive economics requires therefore a kind of rigid focalization on the present, without paying enough attention to the history of the politico-economical relationships. But we simply cannot deny the fact that throughout history we have had radically different politico-economical structures, and that the sort of economical or political relationships that we are having today are not the same as those that existed among individuals in the past epochs. Denying this would lead to a position akin to historicism. Because if historicists are "trying to compensate themselves for the loss of an unchanging world by clinging to the faith that change can be foreseen because it is ruled by an unchanging law"[37], naturalists compensate themselves by denying change tout court!

As such, if we are not to deny the fact that there have been and there can be changes in the form of politico-economical relationships, then we are dealing with a field that is radically different from those of natural sciences such as physics. One of the basic epistemological assumptions in physics is the idea that physical laws do not change throughout space and time. For example, in modern cosmology, we postulate a fundamental principle called the cosmological principle which is usually stated formally as:

> 'Viewed on a sufficiently large scale, the properties of the universe are the same for all observers.' This amounts to the strongly philosophical statement that the part of the universe which we can see is a fair sample, and that the same physical laws apply throughout. In essence, this in a sense says that the universe is knowable and is playing fair with scientists.[38]

Another important example of such a principle in physics is the *Quantum Equilibrium Hypothesis*[39] in Quantum Mechanics. Due to the following three reasons, relying on and invoking such principles in physics is reasonable:

1. In the course of the historical experience of human beings, we have been able to observe that there exist events in nature whose behaviors follow typical and regular patterns. We have then tried to discover representative apparatuses, often by making extensive use of mathematical models, in order to represent these behavioral patterns.

2. Moreover, and once more based on the historical experience of human beings, we have never observed any change in this typical and regular behavior of natural events. It is true that since Hume, we can no longer attribute any sort of necessity to these patterns (or physical laws), in that they could change in a contingent manner at any moment. However, the fact that our historical experience does not give us any example of such changes suffices to say that these laws very probably do not change.

3. Other than the fact that it is reasonable to think that these laws very probably do not change, our historical experience has shown that we have been so far incapable of changing or modifying these laws, so that even if we know that they could change at any moment, we know that such a change would not be caused by any human intervention whatsoever.

Because of these three reasons, invoking the aforementioned principles is highly reasonable in physics and other natural sciences. In addition, it is only when we can invoke such principles, especially regarding the unchanging character of laws, that we can explicate why employing the ideal of representative knowledge with regard to nature is a right attitude, because representing a pattern and making sure that such a representation is testable and repeatable requires that the pattern does not change. However, when we are dealing with the politico-economical relationships, we know that not only there have been many changes in the

36 Robert Nelson's *Economics as Religion* is one of the few works that have put forward this point in a very concise and convincing manner. Donald MacKenzie (MacKenzie et al. 2007) has also written extensively on this point throughout his works but mostly by concentrating on the financial models.

37 Popper 1986, p. 161.

38 Keel 2007, p. 2.

39 Dürr et al. 2013, pp. 60-65.

history of laws and structures, but that these changes have often been brought about by human interventions and that nothing excludes, at least in principle, the human intervention from intervening again in order to change the existing relationships.

This is why applying the epistemology of representative knowledge and the methods that accompany this epistemological position to the political and economical sphere is contestable. This point, nonetheless, does not require the introduction of any sort of ontological or essentialist distinction between the natural and the politico-economical domains. As we saw, it is only historical evidence that justifies such a distinction, and which gives to this distinction an air of probability at least much higher than the assumption of any continuity between them. Otherwise it is always possible to imagine that in the future we may encounter, for example, drastic contingent changes in nature, and the total absence of any change whatsoever in the politico-economical sphere. If such novelties were to emerge, our epistemological assumptions have to change. The aforementioned distinction is thus only justifiable by history, and not by any ontological reasoning.

When dealing with the political-economical sphere, it is therefore not that much the positive knowledge that should guide the normative aspirations as the other way around. It is the normative political economy, with its insistence on the possibility of change, on ideas which, if realized, could change the situation, that should preside over our studying of the politico-economical relationships as they are. I believe that Marx's eleventh thesis on Feuerbach says essentially the same thing, viz. given the fact that the politico-economical order has been marked, historically, by changes, in dealing with this order it is the realization of change that is important, and not the fact of interpreting it[40]. In the natural order, given the absence of any historical proof concerning the occurrence of change, it is, on the contrary, the interpretative work that should be prioritized.

If empirical history gives us the most plausible argument to demarcate science from politics, it becomes easier to understand why Popper's and Badiou's manner of demarcating the two has not been entirely convincing. In Popper, it is his central concept of falsifiability that prevented him from coming up with a more effective way of doing so. It is true that the chapter of his *Open Society and its Enemies* that is entitled *Nature and Convention*[41] does propose very rigorous arguments

40 Saying this should not make us forget that Marx later on abandoned this important insight, when he started to work on a scientific interpretation of the politico-economical tendencies.

41 Popper 2013, pp. 55-80.

in favor of making such a demarcation. However, I contend that his defense of falsifiability conjugated with his rejection of all forms of induction[42] prevented him from getting as far as he could have. It is true that since Hume, the principle of induction can no longer be defended as an undisputable mode of reasoning. But we also saw that in most of our physical theories, we do have physical principles which postulate the presence of different forms of uniformity in nature, foremost among which the unchanging character of laws, and such principles are inductive, not deductive. I also emphasized that the absence of historical proof concerning any change in physical laws does bestow a high degree of probability on these principles. Popper was of course very critical of such principles, and especially of the cosmological principle[43]. But I would argue that his own principle of falsifiability implicitly acknowledges the unchanging nature of physical laws.

Popper does insist on the fact that in the realm of scientific knowledge we never really gain any positive knowledge, and that all our positive knowledge remains hypothetical[44]. But he contends that our knowledge does, nevertheless, progress because we do get closer to the truth not positively, but negatively, that is by weeding out false theories and ruling them out. In other words, even if we can never get to the truth, we advance towards it by falsifying more and more theories. However, if we were to refute the inductive principle that physical laws probably do not change, we can no longer rule out the possibility of having contingent changes in physical laws so that a theory that would have been falsified with regard to past laws would become suddenly true with regard to new laws! Such a possibility would mean that no theory could really be falsified, preventing us therefore from speaking of progress in science even in the negative sense.

Consequently, Popper's falsifiability relies as much on historical induction as the physical principles that he belittles. It is only by accepting this historical sense of induction that his falsifiability acquires its full weight: *given that natural laws probably do not change*, even if getting to the truth is not possible, we can at least rule out those theories that have already been falsified, and in this way we do get closer to the truth, even if only negatively.

Given that his principle of falsifiability does require the probabilistic historical assumption that natural laws do not change to make sense, we see that in the politico-economical domain, given the fact that historically

42 Popper 2002, p. 5.

43 Kragh, 2012.

44 Popper 2002, p. 278.

we have had changes, falsifiability is no longer a pertinent criterion for judging different positions. Instead of trying to criticize different politico-economical analyses by relying on his falsifiability criterion, he must have extended his remarkable insights in the aforementioned chapter of his book.

As for Badiou, it is true that the difference between science and politics is posited not ontologically, but as a historical fact. The fact that Badiou has introduced what he calls the four conditions of philosophy – science, politics, love and art -, in his ontological treatise *Being and Event* might give the impression that their existence for him is also something that can be inferred ontologically[45]. However, it is clear that these four conditions are introduced not in relation to Being, but to Event. The latter, as he says it repeatedly, is that which is not reducible to Being, and of which ontology "has nothing to say"[46], even if the possible consequences of an Event, what he calls truth procedures, are formally thinkable in ontology[47]. That these four conditions are posited historically and not ontologically or in an a-priori fashion shows how impertinent is the criticism of those who ask why there should be four conditions and not more or fewer. The answer is obviously that there are four conditions because historically there have been only four; there could have been possibly more or fewer, but that there have been four is ultimately reducible to the pure contingency of human history. It is therefore true that Badiou has seen the most essential point, the fact that it is ultimately historical evidence that provides the most convincing arsenal for demarcating science from politics.

However, as we have also noted in Popper, other aspects of his philosophy have prevented him from elucidating this point in a way that he should have. For example, one cannot really accept science and politics as different unless one understands what they are. Now if it is the history of each of them that shows us why they are different, it means that it is history itself that teaches us what each of them really is. One may therefore wonder what is the precise function of the meta-ontological part of Badiou's philosophy. The simple answer is that it is his meta-ontology which shows us that truths, if they exist, are generic (or universal), so that the main function of his meta-ontology is to come up with a satisfactory and clear way of distinguishing generic practices from those which are not. But assuming that his meta-ontology does manage to demarcate adequately generic procedures from "all sort of other practices"[48], knowing whether the four conditions are generic, and whether other practices are not, requires that we first study them separately, and for this we should rely on the history of each practice. The problem with Badiou's philosophy is that it is so radically concentrated on introducing the distinction between generic and non-generic practices that it ends up paying very little attention to the proper specificity of each practice. This means that his philosophy is more about saying that science, politics, art and love, contrary to all other practices, are universal and generic, than about demarcating one from the other. We have seen in the course of this article that given different attempts at obfuscating the distinction between science and politics, explaining and justifying the distinction between politics and science is as important as elucidating the way in which the two of them, alongside art and love, differ from all other practices. Badiou's philosophy is not rigorous enough when it comes to the first task.

Moreover, it is not only that Badiou, because of his insistence on the meta-ontological part of his philosophy, has not paid enough attention to the question of demarcating science from politics. There are other aspects of his philosophy which make the introduction of such a distinction difficult. For example, one of the main arguments that he puts forward to defend his thesis according to which mathematics is ontology is to say that we cannot explain, otherwise, the astonishing success of mathematized physics[49]. That is, it is only if that which can be said of Being qua Being is already mathematical that the mathematical grasp of specific regions of Being can be possible. This argument is, however, very contestable from the perspective of a philosophy of demarcation. If mathematized physics is to be taken as an argument in favor of the essentially mathematical character of all that can be pronounced apropos of Being, then the failure of effectively applying mathematics to politico-economical interactions is an argument against it. Unless we take the failure of hitherto existing politico-economical theories as a temporary state of affairs to be superseded by the creation, in the future, of a true mathematized political economy. Such a position borders dangerously on some of the forms of reducing politics to science that we have already discussed.

45 Badiou 2006, p. 17.

46 Ibid, p. 190.

47 Ibid, p. 341.

48 Ibid, p. 340.

49 Ibid, p. 7.

6. Concluding remarks:

There are a number of other issues in Badiou's philosophy that have, I believe, prevented him from coming up with a satisfactory way of explicating the distinction between politics and science. His particular way of defining the difference between what he calls natural and historical situations[50] is one of them; and his advocacy of a politics that should be practiced at a distance from the State, and which should never be about "the treatment of a vital necessity"[51], makes it very difficult to understand his way of comprehending the complex relationship between politics proper and the economical dimension of politics. As I have already mentioned, Marx's failure to adequately elucidate these two separate aspects of politics is probably at the root of all the other controversial parts of his critique of political economy. I would also argue that without coming up with a satisfactory way of distinguishing politics proper from political economy, demarcating science from politics, too, becomes very difficult. However, I did not try, in this article, to provide an exhaustive treatment of the demarcation problem. I merely tried to show that the demarcation problem is a worthwhile and pertinent philosophical engagement. Without wanting to exaggerate its reach, I do, nonetheless, believe that many philosophical questions would become much less pertinent if we could come up with a satisfactory way of thinking the demarcation problem.

50 Ibid, p.176.

51 Ibid, p.380.

Bibliography:

Badiou, Alain2007, *Being and Event.* London: Continuum.

Bohm, David & Hiley, Basil J. 1993, *The Undivided Universe: An Ontological Interpretation of Quantum Mechanics*. London: Routledge.

Cohen, Morris R. 1959, *Reason and Nature : An Essay on the Meaning of Scientific Method*, *NY :* The Free Press.

Dürr, Detlef et al. 2013, *Quantum Physics Without Quantum Philosophy*, Germany: Springer.

Freire. Jr, Olival 2005, *Science and Exile: David Bohm, the Hot Times of the Cold War, and His Struggle for a New Interpretation of Quantum Mechanics. Historical Studies on the Physical and Biological Sciences*, **36** (1).

Friedman, Milton 1953, *Essays in Positive Economics,* Chicago: University of Chicago Press.

Habermas, Jürgen 1968, *Technik und Wissenshaft als "ideologie*", Frankfort-sur-le-Main: Suhrkamp Verlag.

Harvey, David 2006, *Limits to Capital*, London: Verso.

Hegel, G. W. F. 2004, *Hegel's Philosophy of Nature*, Oxford: Oxford University Press.

Hume, David 1993, *An Enquiry Concerning Human Understanding: with Hume's Abstract of A Treatise of Human Nature and A Letter from a Gentleman to His Friend in Edinburgh*, Indianapolis: Hackett Publishing Company, Inc.

Kant, Immanuel 2007, *Critique of Pure Reason*, London: Penguin Books.

Keel, William C. 2007, *The Road to Galaxy Formation*, Germany: Springer-Praxis.

Keynes, John Neville 1999, *Scope and Method of Political Economy*, Kitchener: Batoche Books.

Kragh, Helge 2012, *"The most philosophically of all the sciences": Karl Popper and physical cosmology.*
URL=<http://philsci-archive.pitt.edu/id/eprint/9062>.

MacKenzie, Donald Angus et al. 2007, *Do Economists Make Markets: On the Performativity of Economics*, Princeton: Princeton University Press.

Mannheim, Karl 1936, *Ideology and Utopia*, London: Routledge and Kegan Paul.

Marx, Karl 1902, *Wage Labor and Capital*, Ney York: New York Labor News Company.

---------- 1990, *Capital: A Critique of Political Economy*, London: Penguin Books.

---------- 1993, *Grundrisse: Foundations of the Critique of Political Economy (Rough Draft)*, London: Penguin Books.

Mirowski, Philip 1989, *More Heat than Light Economics as Social Physics, Physics as Nature's Economics*, Cambridge: Cambridge University Press.

Mises, Ludwig von. 2014, *Epistemological Problems of Economzics*, Eastford: Martino Fine Books.

Nelson, Robert H. 2001, *Economics as Religion*: from Samuelson to Chicago and Beyond. Pennsylvania: The Pennsylvania State University Press.

Olwell, Russel 1993, *Physics and politics in cold war America : the two exiles of David Bohm*. Working Paper Number 20, Massachusetts : MIT, available online at : http://web.mit.edu/sts/pubs/pdfs/MIT_STS_WorkingPaper_20_Olwell.pdf

Popper, Karl 1986, *The Poverty of Historicism*, London: ARK Edition.

---------- 2002, *The Logic of Scientific Discovery*, New York: Routledge.

---------- 2013, *Open Society and its Enemies*, NJ: Princeton University Press.

Sartre, Jean-Paul 1985, *La critique de la raison dialectique, tome 1: Théorie des ensembles pratiques*, Paris: Galimard.

Sperber, Jonathan 2014, *Karl Marx: A Nineteenth-Century Life*, New York: Liveright.

Wang, Jessica 1999, *American Science in an Age of Anxiety: Scientists, Anticommunism and the Cold War*, North Carolina: The University of North Carolina Press.

Werskey, Gary 2007, The Marxist Critique of Capitalist Science: A History in Three Movements ?, *Science as Culture*, **16** (Issue 4), available online at : http://human-nature.com/science-as-culture/werskey.html

Notes on the Equivalence between Ontology and Mathematics

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Abstract: This essay collects some thoughts on Alain Badiou's thesis 'ontology = mathematics' and his mathematical metaontology. Issues such as Badiou's selection of mathematics are discussed and evaluated, as well as the possibility of extending the philosophical project towards other mathematical fields. We analyse the metaphysics, or lack thereof, given by this metaontology. We also provide some points of comparison with the analytic philosophy of ontology.

Keywords: mathematics, ontology, Alain Badiou, set theory, metamathematics, metaphilosophy, *Being and Event*

1. The following sequence of schematic remarks[1] provide a précis to some of my recent meditations and assessments regarding Alain Badiou's 'ontology = mathematics' thesis[2] as well as the mathematical metaontology that arises thereof. The relevance of the thesis to the issue at hand, the philosophy-science relation, is obvious when we realize the indispensable roles played by ontology for philosophy and by mathematics for science.

2. The core consideration of philosophy, if we accept Heidegger's intervention[3], is the question of Being qua Being. Ontology is the name of the discourse that focuses on this question. Badiou's thesis audaciously posits that this discourse is what, all this while, we have been calling mathematics. To lay claim to mathematics is to lay claim to a history, archive and ongoing research enterprise that includes arithmetic, geometry, calculus, algebra, probability theory, combinatorics, statistics, topology, set theory, and so on. It also includes the methodological tools shared by fields in applied mathematics, as well as the physical and social sciences.

3. Equated with mathematics, ontology is no longer a subfield within philosophy, even though Being qua Being still constitutes the core question of the latter. Philosophy can only concern itself in a roundabout way, on at most a second-order level, with the essential question of Being qua Being by pursuing mathematical

1 Research for this work was supported by the Universiti Sains Malaysia Short Term Grant [Reference number: 304 / PHUMANITI / 6313326].

2 Badiou 2007a.

3 Heidegger 1996.

truths that erupt following from unexpected and high-impact events. Such truths take the ontological form of generic sets whose infinite weaving is a truth-procedure by a subject. In addition to mathematics, philosophy compossibilizes truths from various other domains, which include art, politics, love, and the other sciences.

4. Badiou's equation must be distinguished from two others given by him in *Being and Event*: 'Being = multiplicity' and 'ontology = ZFC'. Note that the three equations are identities, not predications. Each left side is proposed to be exactly identical to its corresponding right side. Every ontology is mathematical, and every mathematics is ontological, without any excess, exception or counter-example on either side. The Beingness of every being is its multiplicity and the multipleness of every multiple is its Being. And so on for the third equation: ontology is precisely ZFC and vice versa.

5. The second equation, 'Being = multiplicity', arises out of two observations. First: every entity is a multiple, a collection of elements. Second: every entity always exists situationally with respect to another multiple. To be in a room is to be an element among the multiple of elements in that room. Pegasus exists in the collection of entities inhabiting the world of Greek mythology. The number 32 exists in the Peano situation of arithmetic involving whole numbers. To be is to be a multiple and to belong to another multiple. The second equation takes these observations further by daringly postulating Being qua Being to be *essentially* multiple. All there is to the question of ontology is the question of multiplicity.

6. Mathematics has its own name for the multiple: the set. There is a branch of mathematics devoted towards studying sets: set theory. The natural corollary to the equivalence of Being with multiplicity is the reduction of ontology to set theory. ZFC, the collection of Zermelo-Fraenkel axioms plus Choice, is a formal system for that theory. Hence, the third equation 'ontology = ZFC'.

7. All of this does not mean that Being is the same as set or that concrete beings are formed by mathematical objectivities. Being qua Being is linked to the side of inconsistent multiplicity, the count-as-one operation which is prior to the consistent multiplicity of concrete beings.

8. A pure set is a multiple containing other pure sets, all the way

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down to the empty set that contains nothing. In principle every mathematical entity can be constructed as a pure set and the entire edifice of mathematics can be reduced to operations involving pure sets. Ontology is, at the most minimal level, the theory of the pure multiple, of multiplicity itself as such. Set theory is a meta-mathematics, a mathematics of mathematicity.

9. Much can be gained for our understanding of ontology by analysing the ten ZFC axioms and their implications. We can examine the universe of Being qua Being by examining any universe of sets where ZFC holds, with the most minimal being the universe of pure sets. Since the fundamental basis of philosophy can only proceed metaontologically via a program of compossibilization of ontological truths, and since ontology reduces to ZFC, therefore any philosophy must proceed via a close examination of all the definitions, theorems and proofs that the existing mathematical literature has provided about those axioms, as well as examination of the various models that satisfy ZFC. Badiou's accomplishment in *Being and Event* is precisely this.

The Usual Quibbles

10. As we go through the three equations, 'ontology = mathematics', 'Being = multiplicity' and 'ontology = ZFC', we see that that later equations are specific articulations of the consequences to the earlier ones when transplanted into particular mathematical domains. The second equation proceeds from the first when we ask for a meta-mathematics and get set theory as a mathematics of multiplicity. The third equation proceeds from the first two when we ask for a formal axiomatic system for that meta-mathematics and get ZFC.

11. Mathematicians with background expertise on various meta-mathematical systems might find quibbling with the selection of ZFC to be hard to resist. Why set theory instead of type theory, category theory, homotopy type theory and so on, with each theory offering alternative ontological units for the multiple? Even if we use set theory, then why the ZFC axiomatic system instead of Kripke-Platek, Morse-Kelley, Quine's New Foundations, Tarski-Grothendieck, and so on? And why limit our expressive language just to first-order logic?

12. Say we opt for meta-mathematical theory T. We believe it to be better than ZFC for axiomatizing not just mathematics but also ontology. Our belief was established through an extensive and careful analysis justifying the benefits and strengths of T. Nevertheless, as far as philosophy and metaontology is concerned, we have only begun. The task now is to study the mathematical truths of T and compossibilize them, along with truths from other domains, into a rigorous, robust and compelling philosophical system. This is the creative task of philosophy. Understanding the mathematics is not enough. What must be done later is to construct a general philosophy from the mathematical truths. And to do so without the product being simply a philosophy of and about mathematics.

13. The peculiar characteristic of philosophy under Badiou's methodological schema is that it can only parasitize on the truths erupting out of other non-philosophical domains. Philosophical activity is always essentially trans-disciplinary, but without being subservient or sutured to other fields. It originates from indispensable but novel encounters with external domains. For example, Jacques Derrida's famous essay 'Structure, Sign, and Play in the Discourse of the Human Sciences'[4] might be structured as a reading of Claude Lévi-Strauss's ethnological studies. But it is also a creative philosophical work that stands on its own, a work that inaugurated the influential philosophical orientation of what we still stubbornly call 'post-structuralism'.
14. Some philosophers, like Descartes, Leibniz and Russell, were great mathematicians. They were also often directly responsible for the invention of the mathematics that later conditioned their respective philosophies – for Descartes, the cogito; for Leibniz, the monad; and for Russell the original philosophical paradigm for analytic philosophy. Some, like Deleuze, Spinoza, and Plato, were philosophers who were also great scholars of mathematics. Their philosophies might have been conditioned by mathematical results that predate them by several decades, even centuries. The greatness of their thought follows from the intrinsic quality, forcefulness and innovation given by their ideas. Philosophy has its own disciplinary sovereignty that stands apart from other domains. If someone can devise a new philosophical system conditioned by Voevodsky's meta-mathematics of univalent foundations[5], then all the better.

4 Derrida 1993.

5 Voevodsky 2013.

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Ontology without Metaphysics

15. The 'ontology = mathematics' equation is an audacious thesis. Perhaps almost as audacious as the most controversial philosophical equation of all, Spinoza's 'God = Nature'. Two discourses, erstwhile believed to be essentially separate and occupying different disciplinary regimes, are suddenly postulated to be equivalent. What is more, the main question for philosophical foundations 'What are mathematical objects?' becomes not only solved but dissolved.

16. We now ask this: what is stopping us from making our own maverick move and thereby positing 'metaphysics = mathematics'?

17. The two discourses – ontology and metaphysics – are sometimes invoked and used interchangeably. Some philosophers take them to be entirely separate. Some see their domains overlapping, or one being a subfield of another. At any rate, metaphysics investigates questions that aim to compose a complete understanding of fundamental reality. These questions may or may not include the question of Being qua Being. Metaphysicians study more than that by tackling not only questions regarding what things are, but also how they work and how they interact amongst themselves on a fundamental level. Can mathematics and a mathematical metaontology entirely handle these types of questions too?

18. In its radical reconceptualization as mathematical thinking, ontology divorces itself from some chief metaphysical concerns, particularly when they involve the issue of identifying some fundamental origin or some essential oneness. Since Being is essentially multiple and the one is not, then there is no ultimate ground, no fundamental reality behind Being qua Being. Laicized of any fundamental *theos*, the Great Outdoors do not appear to ontology like some bequeathment from *le dehors*. At least this is the case as far as the discourses of ontology and any metaontology is concerned, although this might not hold for philosophies conditioned from other domains of truth. Still, this refusal of the One remains when all these conditions are compossibilized together with a mathematical metaontology consistent with Badiou's equation.

19. Laicized from any metaphysics of lost origins, Being and multiplicity are empty signifiers in this mathematical ontology. Nothing is

behind or beneath them, for the count-as-one is the void. As a discourse, mathematics is meaningless. Lacking a power set (the ontological structure of what Badiou calls its 'state') the situation of mathematics lacks a proper semantics, an essential interpretation of its main vocabulary, particularly regarding the meaning of Being. Bertrand Russell defined mathematics as 'the subject in which we never know what we are talking about'[6]. It is the sole discourse that works without us knowing what we are referring or talking about.

20. This feature allows mathematics to escape the Heideggerian dilemma of the metaphysician's forgetfulness of Being. By investigating Being in an indirect manner without unifying or interpreting it, mathematics can avoid mere ontic thought. This is due to the splits between the axioms and its semantics, as well as certain features of mathematical axiomatics following from Gödel's Two Incompleteness Theorems[7]. The consequence of Badiou's equation is, perhaps, an unexpected accomplishment of Heidegger's dream for the deconstruction of metaphysics[8]. Mathematics is a discourse of Being without focusing on it directly. Moreover, in its refusal of unity, the philosophical system of mathematical metaontology accomplishes an immanent truth that, for him, is even more radical than what had been attempted earlier by Deleuze[9].

21. Insofar as it diagonalizes through the classical dichotomy between the mind and the Great Outdoors, the Speculative Realist issue of correllationism-vs-anticorrellationism is not relevant for this mathematical ontology and metaontology. If some external truth of fundamental reality ever announces itself and impinges on ontological thinking, its emergence takes the form of an event that is both immanent yet novel at the same time with respect to ontology's internal situation. Badiou provides a technical elucidation of this emergent process in his metaontological analysis of Cohen's forcing and generic filters[10]. The generic structure of truth consists of a novel and infinite multiple of existing elements.

6 Russell 2013, p. 75.

7 Gödel 1931.

8 Heidegger 1978.

9 Badiou 2000.

10 Cohen 2008.

22. Mathematics can only be equated with metaphysics if the attempt at a fundamental ground is removed. However the categorial architectures of existence provided by many meta-mathematics do provide some answers to many the usual metaphysical issues. Even though everything is basically a multiple, there are differences. We have sets, relations, functions, equations, geometric manifolds, graphs, formal languages and so on. Moreover, according to Badiou, a different meta-mathematics, topos theory, supplements the set-theoretic viewpoint and provides a way to understand the vertical relationships between multiplicities[11]. Other meta-mathematical foundations, like homotopy type theory or simple type theory could accomplish this as well, provided we do the work. The technical grunt-work of building, understanding and interrelating these multiples has already been done by the mathematicians, not the philosophers, and without some direct attempt as comprehending Being. Quite a lot of the 'metaphysical ground-work' has already been earlier delegated to the mathematicians. Philosophy parasitizes on the technical grunt-work of the mathematicians, but then seeks to do more with it within the domain proper to creative philosophical compossibilization.

23. It would an interesting project, which I will not pursue here, to choose the top ten most important classical questions in metaphysics and, provided they are truly questions for mathematical and philosophical thinking, examine whether they can be resolved using a chosen meta-mathematical ontology, be it set theory, category theory of so on. For anything left, we can then examine whether they can be tackled by a different domain for truth-conditions, such as from the other sciences, or by art, love or politics.

Occasionalism without God

24. As a theory of the multiple itself as such, ontology is reduced to the question of presentation. Or, to be precise, the *facticity* of being present or being absent. Multiples and situations define themselves solely by their count-as-one, by what is present or absent in their belonging-relation. The question of Being is sutured to the question of existence. The question is not *what* but *that* something is or is not.

11 Badiou 2009.

25. In this flat plane of Being, what we observe is a schema curiously akin to what might be called an Occasionalism without God. In the medieval perspective of Occasionalism, no entity is efficiently caused by another as each thing directly appears due to divine power. It is God who causes the second billiard ball to move, not the first billiard ball hitting it. In the ontology of multiplicity, this God is deemed to be either missing due to a doctrine of atheism or irrelevant due to the politics of laicization. Entities just exist, without any vertical relations of causality or supervenience with respect to one another, for a relation is just another entity, another presented multiple. Of the void of Being that is the anonymous count-as-one operation, nothing can be said other than its inconsistency.

26. We can accept this contingent facticity of Being as it is and leave it at that, without any further questioning or analysis. Or we can make this irreducible facticity as the unconscious Unsaid of this mathematical ontology and its corresponding metaontology. Here the impasse of the Real is not an entity's material quiddity, the deep night of its material soul, but the facticity of its existence, without any recourse to some analytic of intrinsic or essential otherness.

27. Pre-Badiou, the mysterious alterity of Being referred, first, to a God and then, later, to some secularized *autrui* (which is really the remnants of some stubborn religious or quasi-theological trace). Post-Badiou, the mysterious alterity shifts to the radical contingency of Being. We have abandoned the theological and onto-theological question 'What is behind it all?' for 'Why are things the way they are?'. Hence: in many post-Badiouian philosophies, some by thinkers grouped today under the Speculative Realist movement[12] and its offshoots, a renewed emphasis on the absolute otherness of this ontological contingency.

Comparing with Analytic Philosophies of Ontology

28. How does this mathematical metaontology differ from analytic philosophy? Does not the latter also have deep respect for mathematics and maintains the figure of mathematical rationality as a model for the clarification and structuring of argument?

12 Meillassoux 2010.

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29. As far as I know, under any methodological attitude that can be called 'analytic' (although this term does not name any centralized monolithic tendency) the philosophical treatment of Being qua Being never goes as far as to equate mathematics with ontology itself. There, the role of mathematics is only methodological and paradigmatic. This is despite – and perhaps also because – of the history behind the early roots of the analytic movement. Following from the developments by philosopher-mathematicians such as Frege, Russell, Moore, Wittgenstein and the Logical Positivists, early analytic philosophy is the consequence of a specific philosophical compossibilization out of the fields of mathematical logic and meta-mathematical foundations. We can easily see, for example, Russell's later philosophical work as a natural progression from his *Principia Mathematica* days.

30. The language and methodology of mathematical logic and meta-mathematics thoroughly permeates analytic philosophical thought, so much so that it could be argued that, in that situation, philosophy has been sutured to its conditions. I dare the risk of going further and posit that, for a large portion of the analytic school, 'first philosophy' is not metaphysics as Aristotle defined it, nor ethics as Levinas posited, but mathematical logic.

31. In Badiou's conception of mathematical metaontology following from his equation, ontological considerations can never be tackled directly, be it by mathematics or philosophy. The Heideggerian dilemma of Being means that ontological thought can never be realised head-on. Unlike in analytic philosophy, the philosophical questioning of ontology cannot precede formal mathematical concerns; one cannot simply construct a new philosophical thought about Being and then formulate it via some mathematical formalism.

32. Equated to mathematics, ontology exists as a sovereign discourse on its own, parallel but entirely separate from philosophy, who often drops by for a visit, like a journalist interviewing the aristocratic socialite for the latest news and gossip. The mathematician William Timothy Gowers writes that mathematicians, when they are doing mathematics, have no essential need for philosophy[13]. Like a hyena, philosophy can only, at most, come later and parasitize on mathematical truths, and only ones that originally erupt from the

13 Gowers 2006.

commitment to some event, but without producing any ontological theorem on its own. Philosophy can only be at most metaontological.

33. Let me attempt to develop this a little bit more with a brief comparison with the most famous essay in the analytic philosophical treatment of ontology, W.V. Quine's 'On What There Is'[14]. The first main point by Quine is that statements about the existence or non-existence of X are clarified using the rule 'To be is to be the value of a variable'. With the help of Russell's theory of descriptions, Quine applies the regimented language of what later became the mathematical syntax of quantified first-order formal logic to understand what we mean on the level of the statement that x exists. Being is discursively captured by the act of existential quantification ranging over some domain of discourse, some ontological commitment about what exists.

34. Badiou's concept of the situation-multiple can be compared to Quine's concept of the existential domain of quantification. They also both share this application of first-order logic. Whereas Quine is only concerned with meta-ontology on the analytic level of existential statements, Badiou wishes to understand the deep structure of Being itself as such. For Quine, mathematics is just a cognitive and rhetorical device for philosophical formulation and the clarification of statements. For Badiou, mathematics is precisely ontological discourse because Being and multiplicity are the same. Ontology is originally accomplished as mathematics by and for mathematicians.

35. Quine's second main point: ontological commitments are constructed based on the best results of the day from the natural sciences. In existential statements, the bounded variables range over a domain of discourse that is determined not from fundamental metaphysical inquiries based on first principles. An ontological commitment is constructed once we have determined some overall conceptual schema for accommodating all and only entities that are indispensable to the best scientific theories. The ultimate arbiters on existence are the natural sciences. This is not inconsistent with what Badiou has given us. The task of ontology and metaontology ends for the question of determining what is presented in the contingent physical world. Mathematics can only provide the overall skeleton for

14 Quine 1948.

the structure of Being qua Being. To use the semantics of possible-worlds, mathematics can only say what all possible worlds have in common, not what exists contingently in each. There is no overall interpretation for multiplicity in mathematics as there is no 'state' for the ZFC axioms. On its own, the most that ontology says is that there is the void.

36. Ontology cannot say whether an apple is made fundamentally of atoms or strings. But it can say, following from set theory, that Being is captured by the notion of set. A philosophical metaontology can be constructed out of the truth of that notion, which was Badiou's project in the first half of *Being and Event*. Moreover, Badiou's metaontology of Cohen's set-theoretic forcing provides a philosophical way for understanding the development of these ontological commitments as new scientific discoveries are made in fundamental physics. Of course, if categories, types or homotopy types are chosen instead of sets then that metaontology would be different. For Quine, the question of what is must be based on the best contemporary science. And perhaps for Badiou, the question of what-is-insofar-as-it-is must be based on the best contemporary mathematics.

37. If mathematics solely accomplishes ontological thinking, with philosophy only feeding on its carcass later, then what to make of other philosophical thinking of ontology by other non-mathematical thinkers? If we are unable to completely reject what, for example, Hegel, Kierkegaard, Heidegger, Sartre or Buddhist philosophy writes about ontology, then how to reconstitute its mathematical trace? Should the task be to dig for them in the archive, through careful explication? From the deep archival recesses of what mathematical literature did Heidegger produce *Being and Time*? Can we not reconstitute his ontology as metaontology and, better, find some unexpected mathematical theorem hidden within its textual unconscious? Could this be new and innovative mathematics, even by the high standards of contemporary mathematicians of today? Or would such philosophies be the un-mathematizable itself and automatically rejected as a thinking of Being?

Philosophy without Meta-Mathematics

38. Let me shift to a different register and ask: how to extend this

methodology of philosophical compossibilization towards results from other mathematical fields such as extremal graph theory, stochastic partial differential equations, or algebraic K-theory?

39. I am still unsure how to approach this task. Note that Badiou himself has only focused so far on a specific type of mathematics, namely meta-mathematical mathematics. To be specific, he examines the meta-mathematics of set, model[15], category, and topos theory, in addition to the meta-mathematics of numerality via a short excursion into the theory of surreal numbers[16]. The issue is whether a properly Badiouian metaontology, one that is consistent with his 'ontology = mathematics' equation, can also be constructed from a mathematical field that is non-meta-mathematical.

40. I suspect that it might be slightly easier, for various technical reason, to build philosophical systems out of properly meta-mathematics fields compared to, say, enumerative combinatorics, ergodic theory, or the study of elliptic curves. By seeking to provide a summation of mathematics via mathematical means, by asking mathematics to foundationally account for itself via its immanent contemporary tools, concepts and methodologies, the subfields within meta-mathematics are already philosophical both in their content and in the required skill-set for their comprehension. Moreover, by being a mathematics of mathematicity, fields such as set and category theory enable an immanent self-referential focus that enables a purer and more impeded access toward a philosophical thought of intrinsic Being. Another crucial feature for meta-mathematics is that they automatically allow for the breadth and universality of analysis demanded out of most ontological and philosophical meditations. Since all mathematical entities are in principle constructible as sets, then any theoretical analysis into the notions of sethood immediately involves the whole generality of mathematics.

41. (This lack of ontological generality is, in my opinion, one of the weaknesses of Deleuze's mathematical metaphysics, which is conditioned partially by truths from the specific fields of differential calculus and differential geometry[17]. Not all entities, mathematical or not, are describable or thinkable in terms of the limited figures of differential equations and smooth manifolds. Deleuze's metaphysics constrains itself by becoming too localized due to its failure to cover the entirety of Being.[18])

42. Post-Badiou, this remains to be demonstrated: a 'proof of concept' for an interesting, novel and compelling philosophical compossibilization of a non-meta-mathematical mathematics. Perhaps more work needs to be done and more conceptual innovation is required. In my own personal attempts, the impasse involves avoiding taking the mathematical definitions, theorems, proofs and frameworks as just similes for some external philosophical conceit. It is not obvious how one may even begin to go about instigating any event of metaontological thought out of, for example, the extremal combinatorics of Ramsey Theory, particularly beyond the often-denigrated route of metaphorical provocation or analogical induction. In my case the difficulty involves moving from the austere formality of the mathematical figure to the crude but profound generality of a philosophical proposition. And to do so while remaining committed to the implications of the 'ontology = mathematics' equation.

43. The unappreciated genius of Badiou's equation is, among others, this diagonalization away from the easy path of metaphor. Badiou's equation means that mathematics is not just a symbol or idiom for ontological ideas. As *precisely* the *immediate* inscription of Being qua Being into thought, mathematics avoids ontologizing indirectly in terms of mytho-poetic symbols that lack rigor or obscure hymns towards some original alterity.

44. Let us however confess that we still have not completely understood the mechanics, politics and ethics behind the employment of metaphorical figures into philosophical thinking. This issue becomes doubly-complicated post-Badiou because philosophy is now understood to be at its core a trans-disciplinary enterprise that, through aleatory movements of commitment and construction, imports truths and vocabularies from other.

45. It is not wrong that normal words and figures become bastardized as they slip between disciplines? Are not all words ossified metaphors?

15 Badiou 2007b.

16 Badiou 2008.

17 The best explication of Deleuze's mathematical metaphysics is DeLanda 2013.

18 The same might be said for Leibniz's metaphysics of the monad, which can be interpreted as being conditioned by his work on the unique prime number decomposition of integers. But to say that Being qua Being is essential prime number, or just number, as the Pythagoreans did, is incorrect.

Jacques Derrida writes that all proper primitive meanings, which are transparent figures, cannot escape becoming metaphorical when placed in philosophical circulation. 'The metaphor is no longer noticed, and it is taken for the proper meaning. This is a two-fold effacement. On this view, philosophy would be a self-eliminating process of generating metaphor. It would be of the nature of philosophy that philosophical culture be a rude obliteration'[19]. Is not truth, as Nietzsche teaches us, just a 'mobile army of metaphors'?[20]

46. I believe much practical guidance and methodological analysis needs to be done, beyond what Cohen's mathematics has given us, on understanding the general process of forcing and of compossibilization as they are implemented by philosophical thinking, while still maintaining and respecting the essential aleatoriness and free subjective sovereignty of that process. Due to certain structural features, the forcing relation differs from the simple logical relation of implication. Philosophical ideas are not logically inferred from non-philosophical truths. 'To force', 'to condition' – this is not exactly the same as 'to cause', 'to influence', 'to inspire' or 'to model'. It is certainly not the same as 'to symbolize' or 'to signify'. And it is not enough to reduce the relation of forcing to the subjective moment of deciding, despite the general phenomenon of bounded rationality in both processes.

Metaontologies of Specific Mathematical Fields

47. Let me end here with a few programmatic notes on the possible construction of a metaontological thought from other mathematical fields. Each of the branches within mathematics, while remaining wholly within a specific subdomain of ontology, concerns itself with specific forms of Being. For algebra, for example, it might be structure or symbolic structure. For arithmetic, it is number and counting. For geometry, metric space or manifold. For calculus and analysis, continuous change or movement. And so on for combinatorics, topology, statistics, probability theory, and so forth. But a mathematical theory also has its own vision and cognitive technology for approaching ontology. Each field within mathematics can be said to supply a unique cognitive machinery

19 Derrida 1974, pp. 8-9.

20 Nietzsche 2012.

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for thinking Being qua Being, technologies which often become even more powerful when they cross-pollinate amongst themselves. Descartes's discovery of coordinate geometry brought about a new way to understand space and manipulate it algebraically. Analytic number theory, the merger of analysis and number theory, allowed us to understand the additive properties of prime numbers using the tools from calculus.

48. Each branch of mathematics draws from different human intuitions, cognitive possibilities, and ontological techne for understanding what is means to be. Take for example, the ontological techne of algebra versus geometry, of structural versus spatial thinking. Observe that it is much easier to count the number of sides on a cube by visualizing it in your head (two front and back, two top and bottom, and two left and right, for a total of six) than to plug in some algebraic formula. The visual part of the brain, its powerful Graphics Processing Unit (GPU) so to speak, is evolutionarily well-equipped towards thinking and intuiting about certain ontological issues involving spatiality than others. The mathematician Michael Atiyah speculates that the fundamental reason, 'is that geometry is the least abstract form of mathematics [....] By contrast algebra is the essence of abstraction, involving a dictionary of symbolism which has to be mastered by great effort [....] [G]eometry is that part of mathematics in which visual thought is dominant whereas algebra is that part in which sequential thought is dominant.'[21]. Algebra and geometry provide unique tools for us to access a thought of Being qua Being[22].

49. (This may explain Deleuze's choice of differential geometry as the truth condition for his metaphysics. The concreteness of geometry and the dynamism of calculus, when merged together, provide the most suitable cognitive technology and perfect paradigm for constructing his philosophy of vitalist materialism. With the recent decline of differential equations in favour of statistical and probabilistic methods in applied mathematics and the natural sciences – not to mention the possible rise in a few years of powerful computerized Deep Learning and Artificial Intelligence methods for data analytics - perhaps Deleuze's entire schema can be modified or updated by replacing differential with stochastic techniques. Might

21 Atiyah 1982, p. 179.

22 To use the Lacanian vocabulary, algebra is closer to the Symbolic whereas geometry is closer to the Imaginary realm of psychic phenomena.

the Deleuzian movement of the virtual, whose ontological figure is the infinitesimal movement, be replaced by some corresponding figure conditioned from probability theory or statistics?)

50. A possible diametrically opposite counterpoint to Badiou's axiomatic metaontology would be mathematical fields that, for reasons mathematicians still do not understand, essentially recede from formal and systematic axiomatization. Some of these fields present what we might even postulate to be an essential resistance, a radical withdrawal, with respect to this Will towards Theory.

51. To be sure, many scientific fields, particularly the most empirical ones, withdraw being engulfed by this Will. Due the unavoidability of non-zero error terms, the limits of experimental analysis, and the essential complexity of life and the élan vital itself, biological knowledge cannot help formulate itself as statistical principles instead of formal theories or theorems. Biological research is rarely about big theories, unlike in theoretical physics and abstract mathematics. In an interview, Badiou even went as far as to reject biology as a science[23] and, by extension, a possible domain for philosophical compossibilization.

52. This struggle against formalization is also present in a different form within many fields within pure mathematics, particularly on the 'problem-solving' as opposed to the 'theory-making' style of mathematical research. For the former, the point of mathematics is to build mathematical theories, and problems are only solved in order to understand mathematics better. For the latter, the point of mathematics is to solve mathematical problems, and mathematical theories are built in order to become better at solving problems.

53. Within theory-building mathematics, we might have most of the subfields of algebraic geometry, the Langlands program, and the work of Badiou's mathematical hero, Alexander Grothendieck, with his famous analogy of solving a mathematical problem as being akin to opening a nut slowly by immersing and rubbing it in soft liquid[24]. For Grothendieck, a problem is solved by building the most general theoretical infrastructure for it. The right theoretical perspective must be erected so that the problem could be solved effortlessly

23 Badiou 2006, pp. 235-6.

24 Grothendieck 1985-1987, pp. 552-3.

and naturally. The solution then becomes the most obvious thing in the world and fits naturally into the larger and abstract narrative. The mathematician William Timothy Gowers writes that for theory-building mathematicians, 'it is important for many reasons to build up a considerable expertise and knowledge of the work [...that] other mathematicians are doing, as progress is often the result of clever combinations of a wide range of existing results'[25].

54. Within problem-solving ontology, we might have certain subfields within combinatorics, partial differential equations and number theory. Grand Unified Theories are often lacking in those fields. The main organizing role is played, not by general abstract theories, but the mathematical tricks and tools. Ontology places itself on the side of techne and not theoria. Abstract generalization of specific solutions can only go so far because they are often uniquely tailored to the problem in question. Problem-solving for such fields can only be done on a case by case and ad hoc basis[26].

55. The well-known problem-solving mathematician, Paul Erdös, is also the most productive mathematician of the past century. His oeuvre can be seen as the invention of a series of ad hoc tricks, modified to fit the situation in question, for solving mathematical problems. For the mathematical field of combinatorics, Gowers writes, "The important ideas [....] do not usually appear in the form of precisely stated theorems, but more often as general principles of wide applicability"[27]. The field of graph theory, which deals with the topology of networks, does not progress by formulating and analysing some formal axiomatic system for the notion of the graph. "[T]he basic object, a graph," Gowers writes, "can be immediately comprehended. One will not get anywhere in graph theory by sitting in an armchair and trying to understand graphs better. Neither is it particularly necessary to read much of the literature before tackling a problem [...] the interesting problems tend to be open precisely because the established techniques cannot easily be applied.[28] Graph theory, an ontology that withdraws from formal axiomatization, is a blind spot to theoretical metaontology.

25 Gowers 2000, p. 3.

26 A famous result in number theory, Matiyasevich's Theorem proves that the general class of Diophantine equations in number theory, for example, lacks a universal procedure for solving it.

27 Gowers 2000, p. 5.

28 Gowers 2000, p. 3.

56. If we allow, as viable truth-conditions to be pursued, these different visions and technologies for philosophical thinking, then a new possibility for mathematical metaontology and philosophical truth might announce itself. If we pursue these alternative to the meta- and theory-building mathematics, then the philosophical project of compossibilization might shift towards an enlarged vista. Ontological and metaontological thought becomes not just the composition of large, though constantly reconstructed and deconstructed, edifices. It can also admit within itself the aleatory dialectic of problem-solution-problem-solution – perhaps not unlike what had been proposed by Deleuze's philosophy[29] – instead of the infinite but abstract weaving of a generic truth procedure and a new generic situation.

57. Or perhaps a different phase of Badiouian metaontological thinking will appear, a mathematical metaontology of technology technicity, not unlike what happened to Heidegger's philosophy after the Second World War with the publication of 'The Question Concerning Technology'[30]. In relation to Being qua Being, ontology thereby will be understood not just as a scientific discourse but a technology of Being qua Being.

58. Perhaps then a new condition, technology – or even engineering – could be allowed to supplement science as a domain out of which philosophical compossibilization could be implemented. An interesting possibility, provided that enough subjects would be committed to it philosophically.

29 See Smith 2004, for the best comparative analysis of Deleuze's 'problematics' and Badiou's 'axiomatics'.

30 Heidegger 1977.

Bibliography:

Atiyah, Michael 1982, 'What Is Geometry? The 1982 Presidential Address', *The Mathematical Gazette*, *66*(437): 179-184.

Badiou, Alain 2000, *Deleuze: The Clamor of Being.* U. of Minnesota Press.

-- 2006, *Theoretical writings*, Bloomsbury.

-- 2007a, *Being and Event*, Continuum.

-- 2007b, *The Concept of Model*, re:press.

-- 2008, *Number and Numbers,* Polity.

-- 2009, *Logics of Worlds: Being and Event, Volume 2*, Continuum.

Cohen, Paul 2008, *Set Theory and the Continuum Hypothesis.* New York: Dover.

DeLanda, Manuel 2013, *Intensive Science and Virtual Philosophy*, A&C Black.

Derrida, Jacques 1974, 'White mythology: Metaphor in the text of philosophy', *New Literary History*, *6*(1): 5-74.

-- 1993, 'Structure, sign, and play in the discourse of the human sciences', In J. Natoli & L. Hutcheon, eds., *A postmodern reader*, SUNY Press.

Gödel, Kurt 1931, *Über Formal Unentscheidbare Sätze der Principia Mathematica und Verwandter Systeme, I. Monatshefte für Math. u. Physik 38*: 173-198.

Gowers, W.T. 2000, 'The two cultures of mathematics', in V. Arnol'd, ed., *Mathematics: Frontiers and Perspectives*, American Mathematical Society.

-- 2006, 'Does mathematics need a philosophy?', In R. Hersch, ed., *18 unconventional essays on the nature of mathematics* (pp. 182-200), Springer.

Grothendieck, Alexander 1985-1987, *Récoltes et semailles. Réflexions et témoignage sur un passé de mathématicien*, *Univ. Sc. et Techniques du Languedoc, Montpellier*

Heidegger, Martin 1977, *The question concerning technology*. Harper & Row.

-- 1978, *Wegmarken,* Frankfurt am Main: Vittorio Klostermann.

-- 1996, *Being and Time*, SUNY Press.

Meillassoux, Quentin, 2010, *After Finitude,* Bloomsbury.

Nietzsche, Friedrich 2012, *On Truth and Lies in a Nonmoral Sense*, Aristeus Books.

Quine, Willard V. 1948, 'On What There Is'. *The Review of Metaphysics*: 21-38.

Russell, Bertrand 2013, *Mysticism and Logic*, Courier Corporation.

Smith, D.W. 2004, 'Badiou and Deleuze on the Ontology of Mathematics', In P. Hallward, ed., *Think Again: Alain Badiou and the Future of Philosophy*, Continuum.

Voevodsky, Vladimir 2013, *Homotopy type theory: Univalent foundations of mathematics*, Princeton: Institute for Advanced Study, The Univalent Foundations Program.

“To be and not to be – that is the answer”: Paraconsistency and Dialetheism According to G. Priest

Emmanuel Barot

Abstract: Ever since Kurt Gödel put forward his incompleteness theorem, an important number of non-classical forms of logic have emerged. Some of these, such as paraconsistent logic, have tried to come up with novel ways of thinking the relationship between logical consistency and completeness. Among these, some, especially the one developed by Graham Priest, have been developed with the explicit goal of vindicating the Hegelian dialectics, and showing its relevance at the formal level. In this text, I will begin by discussing the historical and philosophical debates that existed prior to the emergence of paraconsistent logic, by making extensive allusions to Albert Lautman’s reflections on mathematical philosophy and the conceptual or metaphysical residue of all mathematical formalization. I will then propose a critical appraisal of Priest’s work on paraconsistency, of his *Dialetheism*, by especially focusing on whether it is possible to formalize dialectics, i.e. to successfully capture it at a mere formal level. Discussing this question will necessitate examining, in the concluding section, the uncertain and complex relationship between science and especially formalization on the one hand, and politics and negativity on the other, where I will analyze the formalization of dialectics alongside and in relation to the institutionalization of communism.

Keywords: Paraconsistent Logic, Dialetheism, Formalization of Dialectics, Negativity, Politics and Science, Graham Priest, Albert Lautman

CRISIS & CRITIQUE / Volume 5 / Issue 1

> “To be *and* not to be – that is the answer”[1]
> G. Priest, 2006

This study follows up, in relation to the example of paraconsistent logic, an older one published in 2010 entitled “Lautman’s Duality Against the Hegelian Negativity, and the Paradox of Their Formalizations”. Classically, a contradiction in the logical sense of the term is the conjunction of a formula and its negation (or logical contradiction). A formal system is called “consistent” when we cannot deduce such a conjunction on its basis, otherwise it is called “inconsistent”. The principle of paraconsistence consists of subverting this absolute exigency[2] of consistency, all by avoiding inconsistency: this is done by

1 G. Priest, *Doubt Truth To Be A Liar*, p. 208.

2 Founded at the level of Being by Aristote 2008 Γ, 3, 1005b, 15-30.

allowing, logically, a certain kind of contradictions. Different versions of paraconsistent logic exist, and the latter is merely one of the many ways of doing "non-classical"[3] logics. The common trait of all these different forms of non-classical logics is their calling into question, on a variety of different points, the dominant paradigm since Aristotle until Frege and Russell. What is special about paraconsistent logic is that many of its versions have been produced with the explicit goal of justifying Hegel, and it is in the name of an active self-defense technique of dialectics that I am interested in it. This means that this study, which deals with a singularity within logic, is as incomplete as biased[4], and it takes on a very exploratory dimension.

The introductive section 0 will state that all formalizations of dialectics, as far as they propose a particular interpretation of negation and of contradiction, intervene at the heart of the very idea of logic. Section 1 will posit, first of all, the problem of formalization in its general form, as an undertaking producing retroactively the criterion of demarcating a "speculative" conceptuality from a "positive" conceptuality, from, in other words, a conceptuality potentially rationalizable within the canons of deductive exactitude: what is at stake is to show, essentially, that the very idea of formalization, from the point of view of that which it tries to formalize and the goals that it follows by doing so, gathers in itself all the problems of the moving frontier between the philosophical territories and the (logic)-mathematical ones, and that this problem is above all, and always, a historical one. I will treat, secondly, the formalization of dialectics specifically, by trying to show how in this case the formalization business comes up against antagonistic suspicions which reveal the explosive character of its paradoxes. Section 2 will therefore present the paraconsistent logic in its general lines, the way it has been theorized, syntactically and semantically speaking, by G. Priest, and will dwell, in particular, on examples taken from "dialetheia", in other words, dialectical contradictions which are real and/or logically acceptable, and which bring him, immediately, to intervene *stricto sensu* at the ontological level, by articulating a metaphysical monism and a praxeological conception of Truth. Section 3, rather short, will take stock of the study, and will compare the obtained results with those drawn in 2010 concerning the works of Doz-Dubarle. I will try, briefly, to analyze the fact that, essentially, these two destinies of the negative's

3 Cf. the panorama provided in Priest 2001.

4 For a vision of all paraconsistent theories, cf. Norman, Priest & Routley 1989a; Batens, Mortensen, Priest & Van Bendegem 2003.

formalization make it suffer in the same way – they dissolve it -, even if the two road's difference reveals two very different visions of the problem and of its stakes. Finally, in section 4 I will attempt to present a history of the problem in its different strata, that I will then extend, in a tentative fashion, by a politicization, both brief and radical, of the whole affair.

When Marcuse - partly in the wake of Lukacs for whom mathematics was the most advanced objectified form of reification, both of them relying on Hegelian maxims on the rigidity of the thoughts of Understanding -, undertook his radical critique of the "positive" one-dimensional philosophies, and defended the "bi-dimensionality" of dialectical logic against formal logic, this is because the latter was, in his eyes, the prototype, since Aristotle, of logics of domination and of submission to the established order. There is, he used to say already in Reason and Revolution, under Hegel's authority, "an intrinsic link between mathematical logic and unconditional submission to facts"[5]. We subscribe to this idea; however, in Reason and Revolution as in the One-dimensional man, Marcuse, like most of the dialecticians who work along the same lines, does not live up to his ambitions (and who displays, in the end, the same shortcomings as those who combat dialectics by spreading grotesque prejudices about it). All defenders of the negative thinking should force themselves to look closely into that which they want to deconstruct. And this is the reason why Lukacs or Marcuse are not Hegel and Marx: the latter two did try to enter, in detail, into the logico-mathematical question[6], but the former two did not. It is in the spirit of the latter two that here we wish to contribute, on the occasion of this very particular question of the formalizations of dietetics, to the reflection of a Marxist point of view regarding the respective territories of science and philosophy.

0. Consequence, Negation, Contradiction at the Heart of "Logic"

First of all, some remarks about certain stakes both general and centered on the idea of logic, and about some constraints with which a "dialectical" logic is necessarily confronted are necessary.

Logic is traditionally presented as the theory of valid inference. When Aristotle defines syllogism as "... a deduction in a discourse in which, certain things being supposed, something different from the

5 Marcuse 1968, p. 190.

6 I especially tried to demonstrate that in my PhD in Barot 2004.

things supposed results of necessity because these things are so" (Prior Analytics), he testifies that **at the heart of logic we find the idea of consequence**. A distinction is then imposed: that Y be the logical consequence of X can be a necessary fact independently of our will. But it does not automatically follow from that point that our affirmations concerning the fact that Y is the consequence of X are sealed by evidence. Classical logic comes from Aristotle, and in Metaphysics, Γ, he establishes an unequivocal link between the real and the discourse, so that the latter be presented as an indisputable reasoning: it is not possible to affirm one thing and that which contradicts it from the same point of view and at the same time, because it is impossible for the real to have a property and to not have it from the same point of view and at the same time: the logical principle of non-contradiction relies on the ontological affirmation of the real's non-contradiction. However, classical logic is maybe not suitable for all forms of inference, that it authorizes certain inferences that we informally refuse as doubtful, or that it forbids certain inferences that we recognize as legitimate.

Let us consider briefly "the paradoxes of the material implication": that which characterizes classical logic is the fact that it determines the logical consequence, the implication, above all in term of preservation of the truth. If A implies B, it is because the truth of A implies the truth of B, therefore that it is not possible that A be true and B false. Whence is concluded the affirmation according to which A implies B if and only if we do not simultaneously have A true and B false. From then on, as soon as A is contradictory (false), A false implies B independently of what B is. That is how this "Ex falso sequitur quodlibet" can be illustrated:

> "If today's Bonaparte is communist, then the earth is flat"
> is therefore a logically true affirmation.

Classical logic considers this statement to be valid. Whence, since a long while, the existence of deviant, non standard, logics, which challenge, for example "Ex falso sequitur quodlibet", in different manners: one of them consists of saying that this principle relies on a simplistic vision of the falsity of A, in other words, on a simplistic vision of what a contradiction is, because given the fact that the system is trivialized by contradiction, anything can be deduced. We can thus distinguish between contradictions that render the system trivial, and those that do not do so, i.e. enrich the concept of contradiction. Another way, more traditional, consists of saying that in "Ex falso sequitur quodlibet", there is no link between the premises and the conclusion. At the heart of this plurality, there is the problem of the concept of consequence, of which we can

say that it is not unequivocal: we can think that we do not have in our possession, at the intuitive and pre-theoretical level, an unequivocal and determined concept of what a valid logical inference is. A vague concept, to put it simply, that is to say an absence of concept (as Frege would say it): whence, first important point, the necessity of formalization, and at the same time the possibility of a plurality of formalizations.

We can distinguish, first of all, between logical implication and material conditional: the second one, defined by its truth table, is often used as the first one's basis, for example in Quine for whom "implication is the validity of the conditional", for whom, in other words, logical implication is entirely based on the truth functions, the quantifiers and the variables. But we can approach the problem of consequence from another point of view: when we wish to demonstrate that Y cannot be the consequence of X, that it is impossible, this means that it is necessary that that does not be the case. This amounts to demonstrating that it is necessary that the negation of Y be the consequence of X.

The question of negation is at the heart of logic, as the particular and emblematic form of the problem of consequence. We saw that it was not unreasonable to think that it could be that there exists, in itself, no unique logical consequence that a formalization would capture and codify technically in a legitimately exclusive manner. Correlatively, we could therefore say now that there does not exist, necessarily, only one "negation" whose properties would be fix in themselves. "Negation" would then be a kind of Idea-enigma in the Lautmanian sense, a kind of undetermined: in Lautman, moreover, the relation of contrariety between pairs of notions composing dialectical ideas (continuous-discontinuous, local-global, structure-existence, finite-infinite, etc.) is relatively undetermined[7]; it is, in other words, characterized merely by a relation of polarity and of inversion, of opposition or of tension in the broad sense, in short, a relation of duality, the one, for example, between the Same and the Other; Being and non-Being (Nothing) of which the logical relation of contradiction would be nothing but one possible determination, and in any case derivative.

The whole problem is then to characterize, if it exists, the central rational kernel of negation. The formalizations of dialectics have all the common feature of making the standard, logical, notion of negation, which encloses many things, more complex: bivalence, that is to say the sharing out of legitimate statements among true (T) and false (F), the idea that F is the logical negation, i.e. in contradiction to T, and that there

7 Cf. E. Barot 2009a, ch. II.

is an incompatibility between a statement and the one that contradicts it. Bivalence would be represented, first of all, by the excluded middle, and then by the principle of non-contradiction, which itself would be based on a principle of identity which is unavoidable. This is because things are what they are, and they are not what they are not, therefore that all affirmations with regard to them either correspond to them, or do not, and that therefore all affirmations corresponding to what they are, are incompatible with the contradictory affirmation.

Hence we see that behind consequence and negation, what is at stake is the relation of contradiction. We could believe that a dialectical logic would be justifiable by indicating that these central notions, before passing through the filter of a given theoretical framework, are relatively undetermined, something that would harm classical logics as legitimately as non-classical ones, in short that it would be the "ontological pluralism" of negation which would let us justify a dialectical logic. In reality, the opposite is true in Graham Priest:

> "How does negation then behave? There is an easy way to settle this question. There is no such thing as negation; there are many different negations ... I do not think that this is a good response ... The theoretical object should be adjusted to the real object, and the way the latter behaves is not a matter of choice"[8]

We can, if necessary, imagine that such a realism can be adapted to a technical pluralism, and besides, this technical pluralism is a fact. But Priest stands by the idea that one should try to capture the relation of contradiction which unites two statements, and that the idea that one statement is the logical negation of the other can be founded. From the notion of contradiction, he easily deduces the excluded middle, the principle of non-contradiction, and defines classically the falsity of a statement by the truth of its negation. The problem emerges when we consider impossible situations, in which a statement can be simultaneously true and false, but especially effective situations, in our world, in which statements are simultaneously T and F. How can we reconcile the idea that two contradictory statements are simultaneously true with the idea that they are contradictory? Such is the problem, Hegelian par excellence.

For now, the important consequence is the following: if by the formalization of dialectics we mean the institution of a formalized logical dialectics, then the latter should technically clarify the concept

8 Priest 1999, took up again in Priest 2006a chap. IV "Contradiction". I am translating.

of logical-dialectical consequence that it will call on, given that it will clarify the concept of negation, and will take a stand on the concept of relation of contradiction. And yet, given that these concepts of negation and contradiction are at the heart of the idea of logic, it follows naturally the affirmation that "formalizing dialectics", whatever the precise sense that we attribute to dialectics be, is a way of taking a stand on the fundamental kernel of the idea of logic, this is because there is a native tension between dialectics and the dominant scientific regime of logos. We owe, naturally, our awareness of the meaning of this taking side to Hegel. But before continuing the discussion about the question of the formalization of dialectics, it is necessary that we analyze, first of all, the other side of the problem, which is not specifically logic, but rather transversally logico-mathematical: the problem of formalization in general.

1. Can We Formalize a Concept?

We cannot put forward the question "can we formalize a concept?" under the seal of the eternal: this very general question necessitates a detailed treatment divided between the philosophical and the mathematical fields, something that I will not undertake here. I am only going to try, by taking up again the Hilbertian lesson of the conference of 1900, to formulate as clearly as possible the problem contained by this question.

Asking whether we can formalize a concept is about (1) posing the problem of the respective identities of philosophy and mathematics, (2) posing the problem of the nature of mathematical objectivity (more than that of its "reality"), (3) identifying and measuring the historicity and the specific materiality of these two problems. It is only by relying on such bases that we will be able to show, afterwards, the organic character of these questionings by means of the limit example of the formalizations of dialectics[9]. The problem of the respective identities of philosophy and mathematics, to begin with, will allow me to approach, subsequently, the question of dialectics. And I will depart from the most immediate: both constituents of the general question, the "conceptual" and the "formal".

9 By "mathematics" or "logic", I mean to designate, following Tarski, the logico-mathematical in the broad sense: all that is related to a theory of the classes of objects and the relations that they can have, and that includes, at least, all classical propositional and predicative logics and set theory. This imprecision is naturally subject to caution.

1.1. The Conceptual and the Formal

1.1.1. Hazy Boundaries, Difficult Introjection

Even in a form of knowledge that is highly technical, there exist conceptual determinations, theses, in a more or less residual or implicit state, which deal with problems which cannot be transformed into "objects" or "methods". It seems that it is impossible, by definition, to capture these problematic determinations in an unequivocal manner, because their equivocality, their ambiguity, their "enigmatic" character, is precisely that which makes them recalcitrant towards all such forms of closure. However, it is this equivocality which is at the origin of the famous theoretical inconsistencies that give rise, in their turn, to the willingness to rationalize in order to conquer once more the lost consistency: behind big crises, such as those that stemmed out of the well known tensions of the naïve concept of sets, understood as an indirect tool for rationalizing the number, those are the enigmas of the continuum and the uncountably infinite set which operate. This willingness to "rationalize" found an emblematic formula in the Hilbert program of the early 20th century, which consisted of self-rationalizing mathematics by means of finite formalization of all that was still of a speculative order. The "formalism" is here an attempt at turning the concept radically technical, with the aim of securing the edifice and making it exact: the initiative is about reducing the conceptual to the formal.

1.1.2. "Formalization": General Definition

A preliminary definition is necessary: by the formalization of a given conceptual configuration I mean to designate, in a purely descriptive sense, this kind of *a posteriori* rationalization. We can define the initiative as a retranslation of the theoretical operators ("objects-oriented" or "methods-processes-oriented") which compose it into a series of technically distinct and unequivocal operations, which are differentially identifiable at the syntactic and semantic levels, and of which the axiomatic form is the canonical legalization. The initiative resembles, in a generic manner, that of an *introjection* of concepts which are *de facto* para-formal, ante-formal, infra-formal or meta-formal, etc., the level that I call here "speculative" or "conceptual", in a formal system, at the level of the "formal" or again of the "positive". As such, the formalizing will relies, therefore, on two presuppositions: (1) these two levels are presumably *commensurable*, and (2) this commensurability is posited from the angle of the *reducibility* (total or sufficient) of the first to the second, in other words, of the possibility of abolishing the initially "transcendent", exterior, or "meta" character of the speculative.

Gödel's 1931 theorem[10] forbids the foundational pursuit of this Hilbertian program of absolute reduction: one of the senses of the Gödelian incompleteness is that we do have "conceptual" forms which are irreducible to the formal, and which belong to mathematics. With Hilbert, the question of this reducibility was posed from the mathematical or meta-mathematical point of view. And yet, Lautman, looking at the impossibility of comprehensively formalizing the latter, considered this meta-mathematics to be in fact metaphysics. For him, the *speculative* as such emerged as the irreducible of mathematics itself, which is why he thought that the link between mathematics and metaphysics is not "contingent", but necessary[11]. Thinking this necessity is for him the task of "mathematical philosophy". In other words, such formalization is not necessarily possible on the one hand and even when it is, it is not merely a "technical" operation on the other.

> 1. Being unequivocal and therefore exact can only be reached by starting, there also, from theses which discriminate, in the middle of the equivocality that is being dealt with, elements which are pertinent or meaningful, and by formalizing only the latter: here the technical work always responds to a question that logically precedes it.
> 2. Yet nothing can decide, in advance, if we are dealing with something speculatively irreducible as the result of which all attempts at formalizing it would, a priori, fail. Affirming the irreducibility or the reducibility of the conceptual to the formal cannot be made in advance. Which is why only the formalization effort can allow us to settle the question, according to its failure or its success. We cannot say, in advance, whether something can or cannot, in the middle of something enigmatic, give rise to a positive mathematical knowledge.

It seems therefore that there are speculative or philosophical elements in mathematics only insofar as there are, reciprocally, mathematical elements in philosophy. But is this a good way of describing the situation? There is, therefore, an important presupposition behind the question "can we formalize a concept?": the distinction philosophy/

10 Cf. *infra,* section 2.

11 Lautman 2006, p. 237.

mathematics, which is precisely what we are concerned with. And the correlate of this presupposition (according to which the respective identities of mathematics and philosophy are clearly constituted), is then the one that concerns the nature of the "formalization" initiative: we cannot, from then on, reduce this question to one that is simply about connecting two distinct and exterior orders, more or less motionless, with rather stable contours, and which would allow to situate the question in advance and to characterize its stakes.

1.1.3 Displacing the Hiatus

The speculative, in short, is neither the mathematician's prerogative, nor the philosopher's, it is rather their common fate. A detour by Plato will be instructive. According to him, the difference between philosophy, in this particular case dialectics, and mathematics is related neither to their object (the intelligible, the universal, and the necessary, as opposed to the contingent, the particular and the spatial-temporal sensible) nor to their goal: exposing the object according to its concept, based on its internal necessity, its proper and "natural" law of development[12]. Their difference is related to the fact that mathematics goes by hypotheses (circle, square, etc.), which means that it is marked by a finitude, the ignorance that any hypothesis, as position of existence, envelops. The dialectician refuses[13] this way of stopping at the level of hypotheses, and insists on going beyond them in order to get to the anhypothetical (that beyond which we cannot regress anymore: the One Good).
The dialectician demands that the object be exposed in its absolute necessity, which means the exhibition of its natural cause: the Idea, the suprasensible principle of being and of knowledge.

This is how we get to the categories of dialectics in the Platonist (but also Hegelian) sense - which emerge from Logos both as a discursive activity and as the essence of that which is (and this is how "Logic" rises up, equally in Hegel, in its ontological dimension, and even as ontology) -, which by definition are not simply at the crossroad of the two, philosophy and mathematics, or objects of an equal concern to both: infinity, one and multiple, totality, duality, etc., in short the intelligible is common to both mathematics and dialectics in that it precedes their

12 Cf. Plato 1997, VI, 509d-511e, the famous passage on the subdivisions of line, and the short dialogue Plato 1997, pp. 708-745 *Euthydemus.*

13 This is why dialectics is defined as the "science of free men" (*Sophist*, 253c): free in the sense of free from the opinion and the prejudices caused by the customary language, and here especially free from all constraints other than those of logos itself. The dialectician is never submitted to any law other than the one that thinking itself constructs in its movement towards its object (the essences and itself).

distinction. In other words, the problem of the difference between the speculative and the formal moves inside the speculative itself. And is there, this time, a way of differentiating between that which would be the philosophical conceptual and the strictly mathematical conceptual? The question is not purely rhetorical: it is not absurd to ask whether there are not "official" enigmas of mathematics, and enigmas which would be mathematical only in a secondary way or even not at all. If this is the case, we could consider the principle of formalizing speculative, "enigmatic", proto-mathematical problems to be more legitimate than formalizing notions or categories which are not mathematical or not necessarily mathematical (for example, strictly "ontological" or even theological). In which case we could think that from the philosophical as well as the mathematical point of view, all willingness to formalize is not equally legitimate, beneficial or useful, that all formalization efforts do not have the same worth. But the only reason capable of establishing this kind of discrimination would then be the existence of a difference in the status or the origin of the incriminated "problem", which would render "natural" the first one, but artificial, even useless or illegitimate, the second one. And yet, that implies that we establish an intra-speculative criterion of distinction: there again, that would presuppose that we would have already divided the territories between mathematics and philosophy. We notice that the difficulty which was initially linked to the conceptual-formal opposition has moved within the "conceptual" or the speculative.

Conclusion: this division, in the middle of the conceptual, between that which is mathematical and that which is not seems to be difficult, even impossible, to make, in so far as we do not have their distinction. And Lautman affirms this very same point in the period between the two wars. Following Plato, he renews and extends the dichotomy between the intelligible and the sensible, Being and beings. But he does introduce, compared to Plato, a number of important displacements. In particular, he establishes a functional homology between mathematics and the sensible, which leads to an ontological difference between the speculative enigmas, which he calls the Ideas (dialectical), and the Theories (mathematical). Consequently, metaphysics deals, for him, with these ontological "Ideas-enigmas", which are supra-historical, and whose recurrent presence in history bears witness to their transcendence; as for mathematics, it produces theories which, in the historical context, are different sketches of solutions to these enigmas. Infinity, continuum, space, etc. are such enigmas, which have been present in history since Antiquity in the form of opposing couples (those already mentioned, finite-infinite, continuum-discontinuous, local-global, etc.) which are by themselves neither philosophical nor mathematical,

which are, in other words, both at the same time if we continue to talk on the basis of their distinction, but which are situated, in reality, at a logical level which precedes this distinction. When Bachelard says that the continuum is not an object but a concept[14], or when Feferman says that the continuum hypothesis (CH) –or X's move to *P*(X) – is an intrinsically vague statement[15], are they not saying the same thing? But we can take another example: imagine this other key concept, the concept of existence (with all the problems that it raises in constructivist terms, etc.). For Lautman, even if he is keen on structuralism à la Hilbert, or on the basis of its developments in the German algebra, or his friends and founder congeners of Bourbaki, the couple structure-existence (or essence-existence) is one such Idea-enigma, and not a couple of specifically mathematical notions[16]. If we finally consider the idea of "proof", that is to say the discursive operation destined to justify an enigma by means of resolving a problem (rather than responding to a question), is it not equally prior to this distinction, because it refers to the generic exercise of the discursive rationality? Can we affirm that the idea of proof or demonstration is statutorily mathematical? The codified figures of sequential deduction (constructive, transcendental, etc.) constitute its adequate and exclusive formalizations? That is open to discussion.

We see here, in any event, that dialectics identified to meta-mathematics (and reciprocally) is the place par excellence of reflexivity. For Socrates-Plato, this methodological reflexivity remained par excellence the prerogative of dialectics, in so far as it goes beyond all hypotheses. But with Lautman, we see that if dialectics is really the only discourse capable of apprehending, of characterizing, this hiatus between itself and mathematics, in other words between the conceptual and the formal, it is for this reason that it is also a speculative intra-mathematical reasoning, in this particular case precisely meta-mathematical, as the protagonists of the "crisis in the foundations of mathematics" have testified to it.

In any case, as discourse of the connivance and of the mutual irreducibility of the speculative and the formal, this reflexivity (dialectical or meta-mathematical) appears as always necessarily situated,

14 Cf. Bachelard 1927, p. 221 and suiv.

15 Feferman 2000, p. 405.

16 Lautman illustrates this, in particular, by the relationships between non-contradiction ("Leibnizian "compossibility" of the "essences") and existence, the adequacy between "structural" (syntactic) and "extensive" (semantic, i.e. in terms of domains of objects) points of view being non problematical in the finite case, notoriously problematical in the infinite case (in addition to the theorem of incompleteness from 1931, cf. the non-categoricity theorem of Lowenheim-Skolem).

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historically contextualized and materially textualized. This intrinsically historical and practical sense of the initial question is entirely essential, and the constitutive historicity of the problem of the relationship between the speculative and the formal is precisely one way of making its treatment progress.

But for now, another aspect is going to allow us to advance, in the form of an acknowledgment: a very same speculative "conceptuality" touching these enigmas can give rise to different formalizations, whose compatibility is, moreover, not always immediate. We can logically see this possibility as a mark of an indetermination related to the enigma, indetermination itself expressing the fact that we are short of the distinction between philosophy and mathematics. And here we find, once again, the principle of the technical pluralism of negation and therefore of contradiction already mentioned in section 0.

1.1.4 Indetermination of the Conceptual and Over-(under) determination by the Formal

This indetermination is the fact that the relationships between contrary notions, in Lautman, are open to multiple realizations, to multiple moves to the formal, notably because the relation of "contrariety" is itself relatively undetermined: it resembles the *stricto sensu* logical or proto-logical relation of contradiction, for example in the couple finite-infinite, whereas this contrariety, in other examples, is clearly non logical: thus in the case of the couple structure-existence, or again local-global. For Lautman, the formal intra-mathematical diversity of theories, methods and domains of objects is the response that "the" mathematics "in its present development", practical and historical, gives to this logically prior indetermination of the "Ideas-enigmas". This is why he aims, at the same time, at explicating the way the unity of the enigmas is pluralized in a technical diversity, and at going back, regressing, on the basis of acknowledging this diversity, to the unity of the metaphysical questioning to which it responds. This double movement, descending from the one to the multiple, and ascending from the multiple to the one, it is the double movement of the Platonist dialectics, with which he identifies the mathematical philosophy, which is therefore not a philosophy "of" mathematics which would be applied, from outside, to an initially independent object: dialectics, in Lautman, but also in Plato and Hegel, is not a formal method, but is at one with its object[17]. Three

17 This is why, based on the object of inquiry (the one and the multiple in *Parmenides* whose introduction is provided by a discussion between young Socrates and Parmenides, on the occasion of the aporias related to the "ontological difference" between Ideas and sensible things – difference

remarks are now necessary:

(i) From that point of view we can notice that history goes strangely back and forth, even if this happens with regard to historically renewed modes and objects. At the "functional" level, there are recurrent "schemes" ("patterns" according to P. Kitcher[18]), structures of organization, modes of self-organization and of deployment, which are repeated in the historical movement of the production of theories. These schemes are like the structural conditions of historicity whose effectivity takes the shape of a compliance of mathematics itself with its own requirements of coherence: Noël Mouloud calls this the "teleonomy" of the evolutive knowledge[19].

(ii) But at the level of "content", there exists the same persistence of certain questionings through this historicity and its structures. This persistence is easily revealed through the evolution of the criteria that are used to demarcate that which is mathematical from that which is not, that is to say that which is recognized and legitimized as mathematical and that which is not. For example, the question of constructivity as a criterion for legitimizing a proof is emblematic of this historicity, but what is revealed here is the existence of a functional principle of discrimination, even if the content of this discrimination changes. In other words, what is raised by the process of formalization is the problem of mathematical objectivity as a principally historical problem: the becoming of its legitimization, its continued legitimization. It is important to mention that with regard to mathematical "reality", Lautman insists on the necessity of avoiding all forms of "realism" but also all forms of "nominalism" of first kind: a mathematical reality is verified by its *facts* (a discovery, a theorem) concerning certain *beings* (or objects: functions, numbers, etc.), within the framework of theories determining and resolving certain Ideas-enigmas: all of reality is situated where these fours "instances" or points of view meet, and this meeting point is necessarily dynamic, in other words there is a historicity of mathematical reality, and this

which should be only relative if the seconds are to participate in the firsts -, about the aporias of Zeno on space -, the kinds of being in *Sophist*, the composition of the limited – *peiras* – and of the illimited – apeiron – in *Philebus*, etc.), the Platonist dialectics suffers "metamorphoses": cf. Dixsaut 2001.

18 Kitcher 1984.

19 Mouloud 1989. I develop this notion more in depth in: Barot 2009b, p. 167-179.

is the historicity of its objectivity which indicates it.

(iii) This problem of legitimization is at the heart of all formalization attempts, because the latter activate, by definition, a functional principle of discrimination. Formalization, activating the demarcation between mathematics and non-mathematics by trying to filter the second in the canons of the first, is thus an effect and an agent of the "epistemological rupture". But the will to formalization is not that much the moment where the difference between the conceptual and the formal would be manifested (the implicit idea being that it would already be established), as the moment where it comes into existence, is actualized. In other words:

(a) From a diachronic point of view, it is the very fact of mathematization, of the formalizing process, which retroactively institutes the division into philosophy and mathematics. What is specific about this inversion of temporality is that it naturally transforms, when the process works, contingency into necessity. Science is instituted and is legitimized by being fulfilled, that which gives to the mathematical practice its clear primacy: the mathematizing will therefore envelopes and reveals by its simple "fact" that it is very much more than a "fact", it is the historical process of the structural complexity of objectivity.

(b) But from a synchronic, structural, point of view, it reveals the highly stratified character of the latter, to the effect that even in a formalized theory, especially because of the structural incompleteness which characterizes it, there is the conceptual which remains irreducible to the logico-formal (I started my text with this aspect of the problem), even if it is latent, and becomes patent only in the case of crisis.

Note: Objectivity, Historicity and Fetishism

Mathematization is always an initiative of selective legitimizing, and for this reason understanding its stakes cannot be effectuated in an ahistorical manner, we have already indicated this. More generally, there is no independence of rationality as construction of objectivity, no matter what its modes (logico-mathematical included) are with regard to historicity, that is to say forms of practical and theoretical sociality with which it is necessarily at one, and that they refract even if they are evidently not a mechanical "reflection". That does not mean, flatly and

naively, that mathematics has a history but that it is not invalidated in spite of that: it means, on the contrary, that the question of the necessity of mathematical knowledge should be thought of along with its historicity, and the whole problem is to deal with the nature and the modality of this intersection.

The important point to keep in mind is that all evolutive knowledge of objects, including mathematics, possess a layered internal structure, combining logico-formal stratums, cognitive and socio-institutional constraints[20] in a broad sense, historical-conceptual determinations, the last two kinds of components being, strictly speaking, inassimilable into the first, that is to say partly irreducibly clandestine, and irreducible to formal unequivocalness. Yet these three layers are *a priori* in the sense that we cannot refrain from presenting them, but not a priori determinable if we look at the variations of their material contents which form the concrete becoming of the sciences: if there is a "transcendental", it is only in a not "neo" but post-Kantian sense, and in reality anti-Kantian revised and corrected. These three layers can be said *a priori* in the sense that they are structurally present in all positive knowledge, but are not a priori determinable with regard to their content: just as the a priori of ontogenesis is the a posteriori of phylogenesis, or, in a more Kuhnian sense, the structural principles of a paradigm are the a priori of the instituted normal science, even if they are the a posteriori of history which has led to them. As for the moments of crisis, and especially revolutionary crisis, that is to say the transition between two paradigms, they are the moments where "enigmas" which had emerged in the midst of the first paradigm did not find their resolution in it, and which have consequently occasioned the interrogations to move from the "normal" and technical level to the speculative one. Consequence: all "fetishisms" of mathematical objectivity, all "realist" and ahistorical hypostases of this objectivity, should be renewed or affected by tension using this fundamental sociality of rationality, be it speculative or technical-formal.

20 Evidently, this tripartition is grossly schematic. I conjoin cognitive and socio-institutional foundations due to the fearsome difficulty to which dissociating, to say it rapidly, the "natural" (related to the cerebral and psychological complexion) and the "cultural" (and by that I mean the economical, the sociological, the strictly institutional, etc.) can give rise. This is the whole interest of a "dialectics of nature" as element in the midst of "science" / "dialectics" of history, as theory of the way in which all natural conditions are always or become a social condition by means of their human appropriation.

1. 2. Retouring to Dialectics

1. 2. 1. Shaving Technique of the Ontological Difference

I have invoked the fact that for Lautman, metaphysics deals with supra-historical, and not specifically mathematical, "Ideas-enigmas", for which mathematical theories try to come up, in history, with solutions. As for the mathematical philosophy, it is a "dialectics" which examines, in both senses, this relationship between the supra-historical and the historical. We can think that the difficulties and the speculative character of this ontological difference between Ideas and theories should be abolished – which means that this difference should be abolished as ontological -, and many versions of this abolition have been defended.

(i) We can, for example, read Lautman as a materialist, similar to what Lenin did to Hegel, and turn this difference into a difference of practices, successive or coexistent: between a critical-reflexive practice (critical or at the foundational level, for example during periods of crisis of paradigm, or of revolution) and a practice of direct production (in the "normal" regime). Similarly, we can materialize more substantially Kuhn or Bachelard. One way to proceed is, for example, by dismissing the ontological difference as a psycho-cognitive product of the phylogenesis, that is by apprehending it, anthropologically, as a sign of the age-old relationship of social individuals to a world that that try to control but which always evades them in one way or another – and from this point of view, the identification of the Piagetian spirit of the operational schemes, that is the progressive structuration of the perception, could be considered as a fundamental layer of all reflexive structuration of the real of which mathematics would only be the most rationalized version[21]. Different tastes can find different forms of this more or less reductionist materialization appealing.
(ii) We can also try to reduce the difference by doing away its ontological character without materializing it, for example by explicitly reintegrating the Ideas in mathematics: the most radical way of proceeding in such a way is by simply mathematizing them. This is where the question of the formalizations of dialectics makes its entrance. Concerning Lautman, the essential point to keep in mind[22] is that we note two astonishing reversals of history. The first one is that Lautman identifies mathematics with dialectics because

21 Cf. I had proposed elements in this direction in Barot 2002, p. 33-72.

22 I develop that in Barot 2010, pp. 128-129.

of the Gödelian prohibition: this mathematization does, therefore, the exact opposite; it leads to a distinctly anti-Lautmanian way of proceeding, even if Lautman seems to have been its initiator. The second one is the following: we moved from the question "can we formalize a concept?" to the irreducible hiatus between dialectics and mathematics by means of which the question, through the problems raised by it, finds an adequate formulation. And yet, the idea of a formalization of dialectics has to take on two challenges: on the one hand, it completely illustrates this problematic dimension, but on the other, whereas dialectics since Plato to Lautman was a way of posing the problem of the relationship between the conceptual and the formal, as one way of treating this problem, it becomes, in its turn, its object. Let us get back to Hegel now.

1. 2. 2. Brief Reminder of the Hegelian "Spirit of Contradiction"

The 17th century marks the beginning of a conquering and complete rationalization of the objects and the forms of knowledge under the seal of the operational mathematization, inaugurating a gigantic effort of absorbing, modeled on the insights of physics and mathematics, and in the name of Reason, the "speculative" into the "positive". This desire to reduce the "non-positive", the inexact, the metaphysically suspect, the obscure, the confused and the obscurantist (and most particularly the religious) has been vital for the social, economical and cultural transformation of feudalism. However, this reshaping of rationality was constitutively effectuated with the aid of an operational form and language of reason towards nature and humans, which nourished an increasingly instrumentalist representation of the real and of reason itself. To put it more abruptly: this reshaping since the 17th century has led, in part, to a mutilation of the complexity of the real and its thought, and it is against this mutilation that Hegel rose up during the first third of the 19th century: refusal of the absorption of the speculative into the positive, of the reduction of the qualitative to the quantitative, of thinking to calculation.

Hegel rejects the thesis based on which the reality can be dissolved in the positivity, and the speculative in the scientific. In the real, we also have the workings of the possible, and history is always, unless we believe that it is written in advance, the realization of certain possibilities. This reveals that there is an undetermined aspect in the historical real, and that should be duly cleared up. And yet the world is

one: this non-being can only emerge from within being itself. The only possibility is therefore that being is in tension, in contradiction with itself. Moreover, for Hegel (1) thinking should grant and explain that, but even more (2) it should take itself into account whilst doing that. And this thinking being a dimension of reality, it should consider that it is equally affected, itself, by this negativity. Consequently, separating abstractly the form and the content of thinking is not thinkable: each form is a certain content's form.

Whence his critique of the formalism of Understanding in *Science of Logic*: not as a modality of rationality, but a modality imposing itself as the unique model of rationality, that is as pretending to be exclusive and hypostasizing its form, in this particular case deductivist and calculationist, appropriate to positive knowledge, by transforming it, in a royal manner, into the form of thinking in general.

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1. 2. 3. Attraction, Repulsion: Suspicions

Formalizing dialectics has however had an important sense in a number of trends related to Marxism, because it seemed that such formalizations would lead to an additional legitimization of the dialectical scientificity. And yet, and it is understandable, this operation generates with itself attraction and repulsion. On the one hand attraction because it is, after all, a very fascinating operation, all the more so because its stakes - linking together science and philosophy, and sketching perspectives about novel redeployments of their relationships -, are high. Repulsion on the other, and on occasion giving rise to a double suspicion. (1) Dialectics has always been thought (Hegel, Marx, Marcuse, Sartre ...) as an alternative to all forms of logicism, and as against the form/content separation which is constitutive of all formalisms. (2) On the other hand and correlatively, this is why dialectics, and its subversive core (the existence of crippling, driving, fertile contradictions, etc.) have always been accused, from the perspective of the positive sciences and the formalist logician, of irrationalism. There exists, therefore, a suspicion coming from both camps, based on the irreducibility of the presumed antagonism of the two forms of rationality. Thus formalization is here presented, above all, as a will to reduce the doubly problematic antagonism. (1) From the scientific camp's point of view, that appears as a praiseworthy effort for reorienting the lost sheep (the dialectician): but then the only really good thing in the operation is the formalism itself, and not the dialectics that the latter pretends to capture. This would finally attest, retrospectively and at best, to the scientific, logico-deductive uselessness of the operation (as it was actively repeated by Granger),

and therefore of this presumed irrationality. (2) On the other hand, in the dialectician's camp, that can then appear as a form of betrayal or treachery: pretending to formalize the unformalizable, institutionalizing the uninstitutionalizable, is that not conjointly opportunism and revisionism? Vain or useless effort on one side, betrayal on the other, the idea seems to be that we do not reduce the irreducible (accused of irrationalism in one case, of over-rationalism in the other) by moulding it in the canons of the operational rationality, if not by abolishing it as such – that is, in both cases, by making contradiction disappear. Finally, we get from there to the following situation: there exists indeed a profound hiatus between dialectics and mathematics, and this hiatus is primordial: taking dialectics seriously implies that we recognize that its formalizations miss it. And yet, the question of its legitimacy is therefore the first question, and it is a circular one, because it is only by posing its legitimacy that we can certify it or justify it.

Here, the entirely political dimension of the problem emerges. We find ourselves, in effect, in a limit-case of the relationships between the conceptual and the formal which is by no means insignificant: the negative thinking, discourse of internal contradictions and of the movement of the possible in the middle of what is, discourse which examines what is by using the vocabulary of that which is not, Marcuse has shaped it for us, is the condition of possibility of all revolutionary perspectives. For Lautman, the connection between metaphysics and mathematics is not contingent but necessary: just as here I affirm that these attempts at formalizing dialectics link mathematics and politics in a necessary manner. I will come back to this point in section 4.

2. Paraconsistency According to Graham Priest

There are two major starting points in the approach of Priest, a major contemporary theoretician of the paraconsistency. The existence of a continued interrogation about the paradoxes that affect the argumentative discourse because of the self-referentiality of certain affirmations or reasoning[23] (such as "the liar paradox") on the one hand, Gödel's 1931 theorem[24] which demonstrates that if mathematics is consistent, it is incapable of demonstrating all the truths that it is nonetheless capable of constructing on the other. Gödel's procedure consists of making a detour by a "metalanguage" L' in relation to a "language" L (arithmetic suffices) in which we exercise our naïve capacity

23 Cf. Priest 1979

24 Priest 2006a, pp. 39-50.

of proof. If a statement P of L is not provable in L, we can code it then turn this code into the object of demonstrations in the metalanguage M, demonstrations which appeal to the notions of truth, its properties, its relation to the provability, etc. We can, from that point, find in M a proof, this time of P. Gödel constructs in L the statement "if arithmetic is consistent, then it is incomplete". He codes this obviously self-referential statement in the metalanguage L', and demonstrates it: to say it within the terminology of the problem that here interests us, thus the theorem demonstrates an undecidability, it proves an improvability. It is a theorem of limitation, which indirectly attests to the fact that self-reference carries with it paradoxes[25]. Priest[26] undertakes a rereading of this Gödelian incompleteness and its effects by means of a discussion of the approach proposed by Tarski in 1933-1935[27].

2. 1. (In)consistency, (In)completeness and Semantic Closure: From Gödel to Tarski

We have already seen the way Lautman drew from the Gödelian incompleteness the necessity of assimilating again, against the spirit of the Hilbertian foundational program whose impossibility is attested to by the 1931 theorem, metamathematics into dialectics, and of seeing and comprehending the historical work of the hiatus dialectics-mathematics by means of Plato and, marginally, of Heidegger. The 1933-1935 theory of Tarski can be read, inversely, like a solution of technical bypassing of the problems coming out of the incompleteness. The 1931 result relies on the hypothesis of the consistence of the considered formal systems, and shows that their incompleteness is implied by this consistence. And yet, the important point is that incompleteness exists only if we want it to exist – semantic version of the limitation – that the systems under consideration totally control their semantics (which means that they are capable of proving with regard to their proper "truths"). We can then say, by contraposition, that in Gödel, if consistence implies incompleteness, then completeness implies inconsistency. And for Tarski, the problem is very much there: it is necessary to avoid inconsistency. Therefore, it is necessary to attack its origin: "completeness".

And yet, all completeness can only rely on a "semantic closure". The semantic closure of a language (of a theory, of a formal system,

25 Cf. Cassou-Nogues 2004, ch. III.

26 The most systematic presentation of Priest's approach can be found in Priest 2006a.

27 The important text is the monograph from 1933-1935 "The concept of truth in the deductive sciences". I rely here on his own synthesis Tarski 2009, pp. 247-277.

stated in this language), for example natural language, relies on two elements: it contains the "names" of its proper "statements", and is capable of defining what does the fact of "being true" signify for these statements. To take up again the example of Tarski, "snow is white" is a name of the statement "snow is white". Here the principle is that to all statement α, we can associate a name $\underline{\alpha}$. The important relation between α and $\underline{\alpha}$. Tarski tries to fix what does it mean, for α, to be "true" and he effectuates this by means of the following equivalence:

$\underline{\alpha}$ is true if and only if α

If "T(*x*)" means "*x* is true", then we can rewrite the equivalence in this way:

$T(\underline{\alpha}) \Leftrightarrow \alpha$

This is the "schema-T" or convention-T of Tarski, by which the latter fixes the criterion of "material adequacy" of a statement to the real, based on a very classical approach, correspondence, that is to say according to which a statement is true if it corresponds to what is the case. The problem of a semantically closed language is that it is capable, like natural language, to produce statements about its own statements: it is self-referential. And this self-referentiality engenders paradoxes, contradictions, that is to say it moves us away from a truth which can only result from a coherence of the real itself. This is why Tarski, searching to avoid paradoxes, eliminates the conditions of possibility of self-referentiality by rejecting semantic closure. In order to do so, it is necessary to establish at least one duality between the language L, and the "matalanguage" L' within which we will be able to say if such or such a statement of L is true or not. Naturally, this duality is a logical operation: it is not that much the capacity of constructing distinct languages that counts, but being able to produce a strict demarcation, if we work in a given language, between the latter taken as "metalanguage", and a part of it which will be "language-object". One of the consequences and difficulties of this affair is that it leads to fix outside of language-object its truth predicate.

To sum up, given that it is most important to avoid paradoxes, it is necessary to reject semantic closure (responsible for inconsistency), without this leading to incompleteness, and establishing a truth schema, the convention-T, within the spirit of the Gödelian coding procedure ensuring the move between language and metalanguage, allows to rely on the conditions in which matalanguage can say the truth of language whose metalanguage it is.

2.2. Under-Determination of the Tarskian T-schema and Orientation Towards a Trivalent Semantics

A proof is a process by which we establish that an affirmation is true: disposing an affirmation, we try to find either its proof or its refutation. But based on what? Based on other affirmations which are true, i.e. for which we have already provided proofs etc., and this can give rise to an infinite regression, or to undecidable statements (neither demonstrable nor refutable). Many paradoxes are born in L due to self-reference, and Tarski's solution consists of distinguishing between L and the metalanguage L' which is more powerful than L and contains it. For Priest, for whom natural language remain the primordial concern, the particular case L = L', a case where L is sufficiently powerful for treating it own semantics, remains the most important one: he radically defends the principle of semantic closure[28]. And if we have this equality, them the paradoxes will reemerge: but that poses a problem only if we want to avoid paradox. The originality of the paraconsistent approach is located at that point: for Priest, the goal is not to suppress paradox, but to put up with it for two reasons. (i) Most of the discursive operations are not paradoxical, (ii) at the other end of the problem, due to the fact that reality itself is that which leads to semantic paradoxes. In short, it is useless to dramatize, because in the first case it is not dramatic, the problem is marginal, and in the second case it is inevitable. In a word, a marginal problem inevitably exists. Whence the fact that Priest is essentially interested in these self-referential situations where L = L', that is in semantically closed L theories. For him, it is necessary to accept that the correct formalization of our methods of naive proof is a semantically closed theory containing semantic paradoxes, that is to say a theory at a certain level "inconsistent". His goal is of course to show that at a certain level and under certain forms, "inconsistency" does not carry with it irrationality, is not outside of logic. His aim therefore consists of keeping the T-schema, all by imposing a new semantic signification on it.

Priest hence vigorously challenges the Aristotelian perspective[29], and intends to provide the conceptual foundations of this refusal, that is to say, to contradict Aristotle on the latter's own foundational ground: the ontological one. The goal, henceforward, is not to avoid "inconsistency" but to let it have currency all by isolating it, to give a direction, a local existence to it, so that it does not put a strain on the system globally. Whence his first strong thesis: the consistency hypothesis, which is the

28 Priest 2006a, pp. 125-140.

29 Priest 2006b, pp. 7-42.

first principle of the 1931 theorem, should be rejected[30]. But the second one is equally important: inconsistencies emerging from the semantically closed systems which are considered should be logically characterized as rational configurations, hence rationalizable.

I mentioned in section 0 that all logical theories of negation are in reality always visions of contradictions, of the relation of contradiction. The main implication (if, for example, we distinguish, like Da Costa, between formal, semiotic and real contradictions), therefore, of Priest's theses is that, because semantic paradoxes are not outside of reason, it is necessary to be able to distinguish between exclusively true affirmations, exclusively false affirmations (that is to say "classical" affirmations) and affirmations which are simultaneously true and false, that is paradoxical. This distinction consists of saying that an affirmation can accordingly take three distinct truth-values: true, false, and paradoxical. At the semantic level, the Priestian paraconsistency is therefore translated by the rejection of strict bivalence, in favor, prototypically, of trivalence {T, F, P}. It is by exposing this semantics in "The Logic of Paradox"[31] in 1979 that he began his works, the matrix of the paraconsistent semantics that he would later on develop.

Two things should be now clarified. (1) What is the formal, syntactic and deductive structure adapted to such a semantics? (2) What is the link between such a semantics and Priest's ontological bias? Let us deal with these two points in order.

2.3. Principle of the Formalism of Paraconsistency

Here, I allow myself to use Da Costa's account[32], but with two correlative biases: on the one hand, I will only use a vision of his general architecture, by leaving those aspects of it which are not directly related to my aim aside, and on the other, I presume that this vision, without trying to evaluate the exactitude of the operation in detail, suits Priest. The essential point is to make their general approach clear, and Da Costa is clearer in his account: the style of formalism that he mobilizes, the sequent formalism, is totally adequate for this general aim. The base unit, the sequent (from the Latin *sequor,* "to follow from") is composed of two

30 He makes the distinction between the law of non-contradiction ~(A □ ~A) and the "principle of consistency" based on which no affirmation is simultaneously T and F: for Priest, that ~(A □ ~A) be true cannot prevent, by itself, the instances A and ~A from being true. Given that it is the hypothesis of consistency that implies incompleteness, rejecting it (accepting the conjunction A □ ~A to be T), opens up important perspectives.

31 Priest 1979.

32 Da Costa 1997, p. 237 and suiv.

collections of written formulas on the left and on the right of a symbol « ⊢ » which signifies "proof":

A, B, C ⊢ D, E, F

When we have a sequent without formula(s) on the left, of the kind

⊢ P

it is that the formula P is deduced without us requiring any hypothesis: it is a formula which is "true" according to it own logical form[33]. As for Priest's "**dialetheia**", or dialectical contradiction, it is therefore a statement in the form of:

A ^ ~A

Where, we should remember, ~ is a symbol of negation, and "□" the symbol of conjunction ("and"). What is unique about paraconsistent logics is that they establish that we can, for a given theory T, and without this causing any harm, affirm

T ⊢ A ^ ~A

And yet, when it comes to the principle « EX CONTRADICTIO SEQUITUR QUODLIBET » (called *EC* from now on), based on which the presence of a contradiction in a theory renders it trivial, in other words allows to derive anything from it, classical logics are all in agreement. Let A and B be formulas of T:

∀A, ∀B A, ¬A ⊢ B

And yet, this "triviality", the fact that we can demonstrate anything, makes us lose all kinds of rationality, all interests for the system. The paraconsistent logician does agree: what he then needs is to establish that we can have T ⊢ A ^ ~A, without T becoming trivial. This condition

33 It is important to distinguish between P as "tautology" from the semantic point of view, which is written ⊨ P, and P as "theorem" from the syntactical point of view, which is written ⊢ P. Here I do not go into details of the formal systems which contravene the completeness theorem based on which semantics and syntax coincide, i.e. such that: ⊢ P □ ⊨ P. Obviously, it is when this coincidence disappears (cf. Gödel 1931) that not only things become interesting, but especially the problems at the origin of paraconsistency emerge. In this sub-section, I am only interested in the general technical principle.

of non-triviality should be simply translated by the fact that, given any two formulas of T,

$$\forall A, \forall B \quad A, \neg A \not\vdash B$$

A paraconsistent logic is not trivial because by this definition B is not tautological, or, at the syntactical level, theorem. How do we proceed? By a particular interpretation of negation in the subformula "¬A" of the last writing above. Let us fix, in advance, that the negation with which paraconsistency works is "~", which is different from the classical negation "¬". Whence the two following questions: on what relies the definition of "~"? What is its relation to "¬"?

Relatively to what interests us here, let us remark that only one rule suffices to define, indirectly, the classical negation: it is simply *reductio ad absurdum* (reduction to absurdity), the definition which takes us back to EC.

$$\frac{G, \neg A \vdash B \qquad H, \neg A \vdash \neg B}{G, H \vdash A} \quad (RA)$$

Reduction to absurdity (EC)

Or, more intuitively:

$$\frac{G \vdash A, B \quad H \vdash A, \neg B}{G, H \vdash A}$$

N. Da Costa weakens RA by adding on the right an additional condition, and he names RA_1 the obtained result:

$$\frac{G \vdash A, B \qquad H \vdash A, \neg B \qquad I \vdash \neg(B \wedge \neg B)}{G, H, I \vdash A} \quad (RA_1)$$

With the system of classical natural deduction NA, {NA, RA_1} is very weak; we cannot derive the excluded middle. We can then have this last one as axiom:

$$\frac{}{\vdash A \vee \neg A} \quad (TE)$$

{NA, RA_1, TE} is named *C1* by Da Costa, non-trivial paraconsistent system, which is used by him as matrix. He then posits:

$$\neg^* A \Leftrightarrow \{\neg A \wedge \neg(A \wedge \neg A)\}$$

Then fixes:

$$\frac{G, \neg^* A \vdash B \qquad H, \neg^* A \vdash \neg^* B}{G, H \vdash A} \quad (RA^*_1)$$

That is to say:

$$\frac{G, \neg A \wedge \neg(A \wedge \neg A) \vdash B \qquad H, \neg A \wedge \neg(A \wedge \neg A) \vdash \neg B \wedge \neg(B \wedge \neg B)}{G, H \vdash A}$$

Let:

$$\frac{G, \neg(A \wedge \neg A) \vdash A, B \qquad H, \neg(A \wedge \neg A) \vdash A, \neg B \wedge \neg(B \wedge \neg B)}{G, H \vdash A}$$

That amount to forging "¬*" as a stronger version, more constraining, of negation, in the classical negation's terms. The operation then consists– it seems to me – of somewhat translating this definition, by saying that "¬*" is the classical negation, and "¬*" a weak negation in the terms within which this classical negation is defined. Whence this definition and this rewriting:

Definition. Let the unary connective ~ defined by:

$$\neg A \Leftrightarrow \quad \sim A \wedge \sim (A \wedge \sim A)$$

The classical negation ¬ is thereby defined within the terms of weak negation ~, which is the proper paraconsistent negation. Then we have:

$$\frac{G, \neg A \vdash B \qquad H, \neg A \vdash \sim B \wedge \mathbf{\sim(B \wedge \sim B)}}{G, H \vdash A} \quad (RA^*_1)$$

On the other hand, without the third condition (dotted box) or RA*$_1$, we then have:

$$\frac{G \vdash B \qquad H \vdash \sim B}{G, H \vdash B \wedge \sim B} \text{ (introduction } \wedge)$$

The EC cannot be applied, B ^ ~B is not valid. Q.E.D.[34]

B ^ ~B is the paraconsistent contradiction or "dialetheia", deductible based on standard logic, which naturally provides the framework of paraconsistent logic. It is, in effect, based on the former that the latter, via the above definition, institutes a "weak" negation that allows it to satisfy the existence of contradictions. The principle, furthermore, is equally "classical" in the traditional sense: it is the relativization of the principle of non-contradiction's scope. But, given that the classical negation is defined as combination of formulas and occurrences of conjunction and of the paraconsistent negation, the relationship between these two negations leads to read the process as a move which turns the classical negation into a derivative of the paraconsistent negation – which turns the "strong" into a combination of occurrences of the "weak". These inversed modes of hierarchization of the classical and the non-classical would merit immense developments, but I do not pursue it here.

Let us now move on to point (2), that is to say to the question of the relationship between semantics and ontology.

2.4. Semantic Affairs of the Priestian T-schema

For Priest, with a classical semantics (a set model for example), we can effectively characterize the sense of a statement and the conditions in which it is true. But, on the other hand, that does not give us the meaning, for this statement, of being true, and especially, such a classical semantics does not avoid the semantic "jumps" between the purely true and the purely false, jumps which are induced, by definition, by the dialetheias of this form B ^ ~B. Whence, we have mentioned it, the move to a trivalent semantics, and in particular the distinction which reformulates the idea of "paradox", between Untruth and Falsity[35]. Avoiding jumps or semantic gaps forces us to refuse the classical assimilation of the untrue in the false: the "untrue" is here the "paradoxical", something that is neither simply (purely) true, nor simply (purely) false. Let us see the way it operates.

At the level of the institution of semantics[36], the Priestian approach consists of linking together the formalism briefly sketched above and the T-schema of Tarski. It should be reminded that truth predicate allows us to postulate the equivalence between the affirmation of the truth of a phrase $\underline{\alpha}$ and the affirmative statement α of a state of affairs of which this phrase is the translation.

We can eliminate the parentheses for lightening the writing[37]. What needs to be determined is, therefore, by substitution, under what conditions and with which meaning we can have

$$T(\underline{B \wedge \sim B}) \Leftrightarrow B \wedge \sim B$$

In order to make clear the conditions in which the truth predicate T can adequately characterize this conjunction[38], Priest characterizes,

34 Priest adds, however, in Priest 2006b, § 4.8, p. 86, that his dialetheism can leave RA unaffected under a certain angle. When A ⇒ (B ∧ ¬ B), the classical use of RA consists of inferring ¬ A: by contraposition we draw ¬ (B ∧ ¬ B) ⇒ ¬ A, and by De Morgan and elimination of the implication, (B v ¬ B) ⇒ ¬ A. Priest says that the classical sense of RA consists not of establishing something, but of forcing an enemy to abandon his affirmation of A. From the dialetheical point of view, on the contrary, RA is not logically sufficient for that, because that presupposes that the law of excluded middle (that intuitionistic logic equally contests). In other words, classical RA constitutes the bivalence: the problem of RA is not the principle of the reduction that it operates, but its fundamental sense, which remains the ontological presupposition of Aristotle. All that for saying that the syntactical solution of paraconsistency, the weakening of RA, is a consequence or an effect of a prior decision. Priest is very laconic in this § 4.8, but it seems to me that, essentially, his intention is to remind that the fundamental problem is not a technical one, but very much ontological, something that I find just. It is on that ground that he concludes, taking care to add that if a contradiction is logically possible it is not necessarily rational to believe in it, i.e. believing that all logical contradictions have an effective counterpart in the real.

35 Cf. Priest 2006b, p. 69 and suiv.

36 The presentation occupies above all Priest 2001, p. 53 and suiv., starting from § 4.2 on the "The T-scheme".

37 Moreover, by means of a coding *à la Gödel*, Priest sometimes treats the equivalence T($\underline{\alpha}$) ⇔ α', where α' is the *code* from α, $\underline{\alpha}$ then being the name/sentence of a coded statement. But this is secondary for our purpose here.

38 Ibid., § 4.8 and 4.9, p. 67-72 then chap. 5 "Dialeteic Semantics for Extensionnal Connectives", pp. 73-81 for the principal presentation of these conditions. I am not saying, by any means, that Priest "tries to give the semantics of the deductive scheme of De Costa". The latter proposes, moreover, for his system *C1*, in Da Costa 1997, p. 244-246, a bivalent non verifunctional semantics which inherits the non-verifunctionality of the weak negation ~, that is from the fact that knowing the truth value of a formula A does not suffice to mechanically determine that of ~A. Even if that amounts, in part, to "dualizing" the idea of negation (because ~A is not necessarily determinable in an univocal way), and to having the capacity to attribute simultaneously the values T and F to certain singular formulas, we are not, in spite of that, dealing with a trivalent semantics, the latter, as Priest does it, institutes a third possible truth value for these singular formulas. But this difference *stricto sensu* does not prevent the compatibility *lato sensu* of the two semantic approaches, therefore the legitimacy of a presentation of the Priestian semantics with regard to the De Costaian architecture. I have clarified at the beginning of § 3 the didactic sense of this free "combination".

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firstly, the conditions of satisfaction of the principal connectors in a very traditional manner[39], in a recursive manner on an axiomatic basis. The first axiom, which is used as definition, is the T-schema of an atomic formula:

$T\underline{\alpha} \Leftrightarrow \alpha$

He then defines conjunction and disjunction:

$T\underline{\alpha}$ *and* $T\underline{\beta} \Leftrightarrow T\underline{\alpha \wedge \beta}$
$T\underline{\alpha}$ *or* $T\underline{\beta} \Leftrightarrow T\underline{\alpha \vee \beta}$

And finally negation:

It is not the case that α (*i.e.* ¬α) $\Leftrightarrow T\neg\underline{\alpha}$

The question is: what does "it is not the case that" mean? That is to say, what does "¬" mean? Can we directly infer, from the fact that nothing in the world certifies that α is true, that α is false? In order to understand Priest's responses to these questions, it is necessary to translate "it is not the case that α" by the equivalence $T\neg\underline{\alpha} \Leftrightarrow \neg\alpha$, as he does it, that is to say postulating $T\neg\underline{\alpha} \Leftrightarrow \neg\alpha$ as the T-schema for negation already contains its interpretation of the meaning of "¬α", that is to say his thesis. Indeed, two possible solutions exist in reality, which he makes explicit a little bit further[40]:

Let ¬α mean $T\neg\underline{\alpha}$.

Let ¬α mean $\neg T\underline{\alpha}$.

Classical logic assimilates the affirmation based on which *it is true that it is not the case that α* ($T\neg\underline{\alpha}$) to *it is not true that it be the case that α* ($\neg T\underline{\alpha}$), both are referred to a same affirmation of the falsity of $\underline{\alpha}$. In other words, the classical approach [41] implicitly states that

$T\neg\underline{\alpha} \Leftrightarrow \neg T\underline{\alpha}$

then states, F being the predicate of falsity, that $T\neg\underline{\alpha} \Leftrightarrow \neg T\underline{\alpha} \Leftrightarrow \mathbf{F}\underline{\alpha}$**.**

39 Ibid., p. 60.

40 Priest tends to distill the steps of his approach between diverse digressions; Here, I will therefore content myself with trying a reasonable reconstruction of his proceeding.

41 Cf. Ibid., p. 64.

And yet, the affirmation $T\neg\underline{\alpha} \Leftrightarrow \neg T\underline{\alpha}$ is a biconditional, that is to say the conjunction of an implication and its converse[42]. Priest is attentive to distinguishing them:

(1) $T\neg\underline{\alpha} \Leftrightarrow \neg T\underline{\alpha}$

(2) $T\underline{\alpha} \Leftrightarrow T\neg\underline{\alpha}$

Given that by the *T-schema*, we have, for the negation $T\neg\underline{\alpha} \Leftrightarrow \neg\alpha$, **in case (1), that implies:**

$(\neg\alpha \Leftrightarrow) T\neg\underline{\alpha} \Leftrightarrow \neg T\underline{\alpha}$

(If it is not the case that α), it is true that α is F, therefore it is untrue that α be the case. **The falsity of *α* implies its untruth.**

In case (2), that implies

$(\neg\alpha \Leftrightarrow) \neg T\underline{\alpha} \Leftrightarrow T\neg\underline{\alpha}$

(If it is not the case that α), it is untrue that α be the case, therefore it is true that α is F. **This time, the untruth of *α* implies its falsity.**

Now, let us see what we will have if we have α and ¬α, that is to say respectively by the T-schema $T\underline{\alpha}$ et $T\neg\underline{\alpha}$. Based on the conjunction's definition, we then have

$T\underline{\alpha \wedge \neg\alpha}$

that is to say by De Morgan

$T\neg(\alpha \vee \neg\alpha)$

By principle (1) ($T\neg\underline{\alpha} \Leftrightarrow \neg\mathbf{T}\underline{\alpha}$), that gives

$T\neg\underline{(\alpha \vee \neg\alpha)} \Leftrightarrow \neg T\underline{(\alpha \vee \neg\alpha)}$

It is true that $\underline{\neg(\alpha \vee \neg\alpha)}$, let $\underline{\neg(\alpha \vee \neg\alpha)}$ be false, then *$(\alpha \vee \neg\alpha)$ is untrue. And if* $(\alpha \vee \neg\alpha)$ is untrue, then $(\underline{\alpha} \vee \neg\underline{\alpha})$ is true, that is to say (by De Morgan) that

42 Ibid., p.70.

$\underline{\alpha \wedge \neg\alpha}$

is true, because being true and untrue, it is not false.

We can therefore provide the semantic affirmation T($\underline{B \wedge \sim B}$) for the syntactic deduction of $B \wedge \sim B$, which is what we were seeking. This amounts to saying, finally[43], that everything can be expressed in terms either of truth, or of untruth, and that the falsity of the strict sense is nothing but a part of the untruth.

And yet, if we consider, this time, principle (2) ($\neg T\alpha \chi T\neg\alpha$), we start straightaway from an interpretation of negation as being destined to indicate (through the transitory intermediary of untruth, as antecedent of the implication) falsity (into which all untruth is absorbed and dissolved). The second principle transforms the conjunction of $\neg T\alpha$ and $T\alpha$ into the affirmation that α is purely and simply (that is absolutely) T and F at the same time, that is to say absurd. The classical affirmation $T\neg\underline{\alpha} \Leftrightarrow \neg T\underline{\alpha} \Leftrightarrow F\underline{\alpha}$ identifies, absolutely, untruth with falsity, and that relies on the conjoint affirmation of the two abovementioned principles (1) and (2). Priest names them, respectively, principle of exhaustion and principle of exclusion. The dialetheist totally accepts the required exhaustion, but rejects, on the other hand, this exclusion, which expresses nothing other than strict bivalence. Conclusion: principle (2) should be refused[44].

This amounts to saying that the biconditional of the T-schema, $T\neg\alpha \Leftrightarrow \neg\alpha$, should not be biconditionally used in order to characterize negation, in short, that it is not an authentic biconditional[45].

To sum up, if falsity implies untruth, untruth does not imply falsity: untruth is therefore the "paradoxical" intermediary between the purely T and the purely F. The lack of support for an affirmation does not suffice to logically affirm its falsity, or in other words, a merely logical argument is never sufficient for affirming falsity: the classical logician should provide a proof for the falsity's effectiveness, that is to say to exhibit something in support of the latter. Just as the dialethetician should provide an extra-logical proof for the fact that non-falsity is not a synonym for truth. In

43 Here, the classical interpretation of implication amounts to saying that the validity of implication does not hurt that of the antecedent, which is why Priest reassumes here one of the paradoxes of material implication invoked in section 0. The big difference is that he reassumes it explicitly on the basis of motives which lack in the classically treated material implication, all by stipulating, I will come back to it later, the limits within which this "paradoxicality" should be fitted.

44 Priest 2006a, p. 78-80.

45 All of ibid., ch. 6, "Entailment" develops this problem. For more details, it should be systematically referred to.

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that case, all real proofs, he says, are combinations of *a priori* (logical) elements and empirical elements[46], and it is precisely at the empirical level that "paradoxes" are observable. It is therefore necessary to get out of the formalized concept in order to go towards the only thing that can complete its insufficiency: the world.

And here we need to pose a question: refusing that untrue imply F is also refusing that the untruth of $B \wedge \sim B$ imply its falsity. But what is the nature of the affirmation of this untruth itself? Is it absolutely T, or itself paradoxical, that is to say true and untrue? Can we, should we, and how, verify whether it satisfies, itself, the truth predicate? To respond to that, it is necessary to move to a superior level of language, like in Tarski, moving to a metalanguage etc. If we remain at the level of language, that is within the semantic-syntactic level, it is infinite regress that therefore begins. The response to this question is impossible from this purely logical point of view, quite simply because for Priest, the logically admissible character of $B \wedge \sim B$ does not harm the rational character of believing in its reality: or in other words, it is necessary to discriminate, in the world, between what is contradictory and what is not.

Providing a semantics, a model, as plurivalent and alternative as it be, remains an intra-logico-mathematical operation. It results from this that the formal under-determination of the conceptual content of truth predicate is not compensated by an alternative semantics of this kind. The sense of statements and their truth are distinct things, he even says that they are "independent variables"[47]: this amounts to saying, naturally, that logics is incapable of defining the truth. It is therefore necessary to nuance the Fregeian patronage previously invoked: if fixing the sense of a statement is giving its truth conditions, giving these truth conditions is not giving this truth itself. To this end, an ontological solution is required, and this is the case in Frege himself, who opts for a hyperrealist solution (in the sense of a "Platonist realism" of the logico-mathematical objects).

2.5. From Semantics to Ontology: Examples of "dialetheias"

But if, for Priest, it is necessary to go beyond not only syntax, but also semantics *stricto sensu*, because there is a conceptual under-determination of the truth predicate, in short, if the situation imposes an ontology, it is the radically anti-Fregeian path that he takes. In so doing, he finds again the fundamental theme of Lautman for whom the

46 Ibid., p. 67.

47 Ibid., p. 60.

rapprochement between mathematics and philosophy is necessary, because the objet of mathematics is irreducible to its objects (syntactically-semantically determined), and this theme is translated by a same refusal of all logico-mathematical ontologies. In short, like Lautman he avoids what I call the ontological pitfall (which carries a generic fetishism), that is to say the belief based on which the ontological problem of logic and mathematics is a logico-mathematical problem, which would necessitate an oscillating position between the "realist" pole and the "nominalist" pole[48]. The sense of the approach is fundamental: it consists of refusing to locate the ontology of or concerning logico-mathematical within logico-mathematical, be it for assuming it or criticizing it. In short, the approach radically displaces the problem's ground. It is true that Lautman locates the ontological problem in the Ideas by etherifying it, and we have already mentioned the fact that the "ontological difference" could be dealt with in ways more convincing than the way he thought it. Priest, in my eyes, takes such a path: he situates the ontological problem in the concrete reality, anchors, in a Hegelio-Marxist[49] mode, objectivity to a reality defined by the fact that it is the condition and the object of concrete practices[50].

Let us get back to the first question: why avoiding inconsistency is not the goal? Why is it appropriate "to accommodate them" [51] only, or as Da Costa puts it, to "master and control"[52] contradictions? Quite simply because contradictions really exist. An authentically paradoxical affirmation, for Priest and for Da Costa, is the discursive expression of a paradoxical reality, or rather, of portions of paradoxical reality. This last nuance is important: "it is important not to multiply contradictions beyond what is necessary" [53] he says, an economical postulate which consists of saying

48 Naturally, one nominalist option is more directly favored by Marxists, it is "realism" which is the most radical mystification: here I agree with Priest 2006a, p. 151, who refers, again, to Marx on this point. But if nominalism is employed as an anti-ontological position on ontology's ground (logico-mathematical), it does not elude this critique.

49 Priest 2006a, § 10.4 "Mathematical Realism", p. 151.

50 Ibid., § 10.5, "... And Anti-Realism", p. 153. It is here the point of fundamental articulation with the other angle of assault presented in Annex 2: its detailed articulation will be the subject matter of the next work on these questions. In what follows, I leave the systematic evaluation of Priest's Hegelo-Marxist claim in suspense. The last part can be regarded, that said, as the indication of a limit of his approach (the way it appears in his texts): the absence of politicization of the stakes and of his ontology, and of the dialetheical edifice that he constructs on its basis.

51 Ibid., p. 72.

52 N. Da Costa 1997, p. 237.

53 Priest 2006a, p. 71.

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that the world is not only filled with contradictions and paradoxes, even if it does contain a few.

The stake of the semantic closure is here manifested: it is because there is only one reality that there should be, basically, only one language, and this is why the latter is closed, and that there are paradoxes. The foundation of paraconsistency and of its semantics is an ontological monism. Priest takes up the Tarskian distinction between statement and name, in the form of the distinction between statement and its sentence, and the truth predicate "T(*x*)", by positioning himself under the authority, beyond Tarski, of Frege for whom giving the sense of a sentence is giving its truth conditions. And yet, a first objection that he addresses to Tarski is that his truth schema, if it characterizes (possibly) what it means for such a statement to be true, it does not provides a concept of truth, that is to say it produces a problematic semantic indetermination. As for him, he wants, on the contrary, to furnish such a concept of truth. For him "dialetheism", his conception based on which true and logically receivable contradictions exist, does not, like standard logic, summon by itself, i.e. as a theory of logic, a particular conception of truth. All particular conceptions of truth presuppose, *de facto*, an otology, monist in his eyes.

Let us take a look, now, at the essential characters of this monism of Priest. He starts from the Hegelian affirmation based on which, in keeping with Kant's "transcendental dialectics", correct reasoning, proceeding based on the legitimate application of certain concepts, leads to contradictions: these concepts are therefore contradictory or carry contradictions. Priest takes up this idea: our concepts are inconsistent, they produce *dialetheias*. Hegel was therefore right, and logical paradoxes, whether semantic or set theoretical – with their common self-reference – bear witness to it, even if only by their appearances. But inconsistency does not imply incoherence, especially because this inconsistency happens, beyond discourse, in the real – that the real is never incoherent in the sense of being irrational. A therefore fully intelligible postulate.

Many non-literal interpretations of "contradiction" have been given, including, starting from the 1950s, those by Soviet philosophers, who defended the idea that contradiction, if it could belong to thinking, was not nonetheless real. But the general opinion, even when it satisfies the idea, does it by saying that dialectical logic should be at least compatible with the Frege-Russell paradigm, the most general axiology for the norms of scientific and correct thinking. In that case, also, contradictions have often been reinterpreted in a softer fashion. For Priest, this Fregeo-Russellian paradigm is only a theory; on the other hand, and

this is a second very strong thesis, the central theoretical meaning of contradiction in Hegel and Marx is precisely the logical meaning[54].

2.5. 1. Movement

In two very interesting articles in the 1980s, Priest develops many interesting examples. The first one, that he takes up again in *In Contradiction*[55], is about movement (as the relationship between matter, time and space), and in particular, as Zeno's aporias showed it in their time, continuous movement. In any concrete continuum, there exist either contiguous and opposed properties, that is to say a part of continuum where it is not true that all be A or not-A (for example, in a color continuum going from red to another color, there is an intermediary moment where we are still in red and outside of it), or a region where something is more simply A and non-A. Here we find movement again, in its generality, the way Hegel conceptualizes it.

The domain of classical logic is "consistent", that is static. And yet, it is of course movement that engenders contradictions. Let C be a body situated in s. What is the difference that we can establish, at a given instantaneous moment, between C when its being is in movement, which by definition is not an internal state but a relational situation, and its being at rest? In a Hegelian fashion, let us consider the sentence A "C is in s":

if C is at rest, A is true
if C is in movement, it has always already started to leave s:
therefore the negation of A is true.

Thus, A is true and false at the same time, and Priest's goal is to supply a rigorous semantics for this affirmation.

2.5. 2. Alienated Work, Commodity

Priest also takes two examples directly from Marx: alienated labor in *The Economic and Philosophic Manuscripts of 1844* and commodity (use value/exchange value) in *Capital*[56]. He reminds us that in the *1844 Manuscripts*, human, for Marx, is telos, the generic self-development of the individual and of humanity by labor. And yet, alienated work is self-alienation,

54 "Priest 1989, pp. 388-415, p. 391.

55 Priest 2006q, ch. XI & XII, p. 159 and suiv., p. 172 and suiv., and a little bit further, ch. XV ; "III : Time", p. 213 and suiv.

56 "Priest 1989, p. 398.

alienation of work by capital (dead labor, accumulated labor), that is the loss of essence. Like the self-realization of humanity, the work *h* is such that:

$h = h$

As alienated, the work *h* is however

$h \neq h$

Thus work is simultaneously identical with and opposed to itself.

Concerning the first volume of *Capital*, Priest looks at the commodity as an object *a* which can be used (fact *Ua*) or exchanged (fact *Va*). When *a* is used, it is not exchanged, and reciprocally[57]. With ~ as the symbol of negation and ∧ as the symbol of conjunction, that gives us the following:

$\sim(Ua \wedge Va)$

However, in commodity exchange, each commodity is linked to another one as Va and as Ua at the same time, and especially the strong idea of Marx, exchange value presupposes its "carrier" use value, even if the latter is put in parenthesis from the point of view of capital's accumulation. So that we also al-ways have:

$Ua \wedge Va$

And Priest adds in the article that the real "being" of *a*, which he indicates by the symbol "^X", in order to say "the being of X", is thus:

$^Ua = ^Va$

In other words, both have the same extension, they denote the same thing. In the article, Priest does not directly reformulate that with the T-schema, but we can take the risk of saying the following thing. Let $\underline{Ua}$ and $\underline{Va}$ be the names of Ua and Va. Moving to their *being* means affirming that:

$T(\underline{Ua}) \Leftrightarrow T(\underline{Va})$

57 Ibid., p. 407.

Following the equivalence

$T(\underline{\alpha}) \Leftrightarrow \alpha$

We can then affirm that

$Ua \Leftrightarrow Va$

Moving to "being", of which he says, in the article, that it is money, that is in reality capital (including money when it functions as capital, that is to say according to the regime of self-valorization), is therefore moving to the truth of dialethia: the underlying unity of the difference between Ua and Va. An ideal example: the idea of *being* and the idea of truth are completely in parallel, which shows again that the question of truth is not a logical question: be it an ontological question as in Hegel, or a practical question as in Marx, non-dialectical logic is not, for Priest, the place of truth, but only a place of its manifestation.

In a posterior text, Priest responds to an objection[58] addressed to this double example. The objection consists of saying that the account of the simple form of value, the exchanged commodity *a* (20 yards of linen) and commodity *b* (a coat) with which it is exchanged are respectively the exchanger, exchange value, and exchangee, use value. The objection consists, simply, of saying that here there is no contradiction *stricto sensu.* Yet, this simple form of value is only a moment, the simplest abstraction ("the simplest, the most isolated, or the most accidental form" says Marx), of the exchange process: this moment never appears really alone. The real exchange of *a* and *b* is always symmetrical, both are exchanger and exchangee, and for this reason commodity is use value and exchange value. And it is not only the exchangee, but also the exchanger that is always both: use value as exchange value.

This is the reason why for Priest, the method of *Capital* concentrates the major stakes of all logical dialectics (quite independently of all formalisms). There is nothing original as such about this idea. What is interesting here is to see the way Priest articulates, on this point, the conceptual analysis and the goal of formalization.

These three examples (movement, alienated labor, commodity) are used by him as matrix of what he names dialetheias, i.e. logically true and untrivial contradictions, responsible for inconsistency, but expressive of a fertile paraconsistency. For him, the exact nature of dialectical

58 Priest 1990, p. 468-475, Marquit 1990, p. 147-166.

contradictions is given by the general form of "dialetheias"[59]. Not only we have

$(a = b) \wedge (a \neq b)$

But in reality, we especially have

$(a = a)$ c $(a \neq a)$

Which means
Unity within difference.

This is the form of dialectical contradiction to which the others are boiled down (and on this point, Priest opts, naturally, for the thesis of the continuity between Hegel and Marx). The two main forms of this unity within difference are the followings:

(1) The identity of one thing with its opposite-contrary: one thing is identical with itself in that it is different from itself.
(2) The fact of one thing being F and ~F at the same time. Thus movement: the state of movement is one based on which a body which is in a certain place is no longer in this place: it is *A* and *~A* simultaneously. Therefore, the fundamental signification of dialectical contradictions of Hegel and Marx is, for Priest, this logical signification, but a "logic" stuffed with the total weight of *one* world.

2.5. 3. Teleological Determination and Praxeology of the True

According to Priest, we can describe all states-processes of change starting with the form ~A = A, seen under the intensional angle of the move to the opposite, from "going over"[60] of A in ~A. For Priest[61], all dialectical contradictions are therefore instants of the unity of opposites. The poles of dialectical contradiction have a stronger relationship that a pure and simple extensional conjunction, because *a* and *b*, even if different (thus, in this instance, of a and ~a), remain identical. The dialectical identity is therefore an intensional identity: the relation that exists between the two poles of a dialectical contradiction is not static

59 Priest 1990, p. 410-412.

60 Ibid., p. 411.

61 Ibid., p. 412.

but dynamic: this question of process is essential. The classical concept of contradiction is dominated by the extensional vision: in (A ∧ ~A), there is no essential relation between the two joined terms. So that we can eliminate the conjunction and affirm one, A, independently of the other, ~A (for example, in the elimination of conjunction in natural deduction). Here, dialectical contradiction necessarily emerges from an intensional vision[62]: it is the internal relationship between the joined terms which is not captured/capturable by an extensional conjunction. For him, an intensional approach goes, therefore, hand in hand with an ontological monism which alone makes possible a thinking of contradiction as unity within difference – and beyond the idealism/materialism opposition, the thesis of a radical monism, and therefore the thesis of reality as antagonistic totality, is shared by both Hegel and Marx.

To sum up, for Priest, the Tarskian convention-T does not offer a characterization, even only implicitly, of truth[63], even if we can consider it as offering the meaning of α and the implication for α to be true at the same time[64]. It captures logical relationships between sentences, but these sentences emerge from a practice, and truth concerns the way these sentences are used, pronounced, within the framework of this practice: yet, truth is the telos of the fact of affirming (just as playing a game has a goal: winning): whence, the "teleological" determination of the true[65] with which he goes along, that is a conception of the true as being always situated, truth exists only for those who seek it, for those who turn it into their telos, and that is, necessarily, part of a practice. This amounts to proposing a true concept of truth. Whatever the precise conception of this semantics be, the idea is that the truth or the falsity of an affirmation stems from a relation to the *existence* of something which either is the case or not. But trying to know what is the case and what is not "deobjectivizes" the question, and situates it: without going into details, the foundation of the teleological semantics is therefore praxeological, practical. The unity of the real, of the discourse and of the practice summons a monist conception: the foundation of dialetheism is therefore a monist "metaphysics", that is to say an above all Hegelian workmanship, and it is only in the midst of this unity-totality that the question of truth is posed in an always situated and oriented manner[66].

62 Ibid., p. 396.

63 Priest 2006a, p. 61.

64 Ibid., p. 60.

65 Ibid., p. 62, the formulas comes from Priest. Cf. Priest 2006b, p. 43-44 and p. 47-49.

66 This is the result to which whole of ch. IV of *In Contradiction* leads.

3. First Broadening of the Problem: the Monist Stake Behind the Epistemological Debate

3.1. Conjoined Results of Both Studies: Divergence of Orientation and Pseudo-Dialectical Convergence in Doz-Dubarle and Priest-Da Costa

The results of our study from 2010 [67] were the following. In **Doz-Dubarle**, the operation consists of, for seizing the *Aufhebung*, instituting the term null ∧ and the operators of "deposition" and "relevement"[68] as two operators of "negation" adding themselves to the negation understood or treated as the algebraic relation of complementation (for the new terms added up to those of the propositional calculus, which operate with the if-then connector, that is the traditional implication). In the categorical version: (1) If we have in mind the formalization project of Lautman sketched by F. Zalamea, AND the fact that Lautman does not consider that there are real contradictions, then in a certain way the problem disappears all by itself, given that his dialectics, rejecting internal negativity, is nothing but a "pseudo-dialectics". On the other hand, (2) the willingness to formalize the unity of contradictions within category theory (Lawvere), if that should be in a really Hegelian sense, maintains the problem in all its acuity. Doz and Dubarle are, first of all, closer to Hegel from the point of view of speculative literality: they seek to come up with a formal model of the *Aufhebung* by giving a formal existence to the movement of the negative by which the abstract universal, by the mediation of its particularistic negation, is actualized in a negation of negation, in the concrete universal which is the singular. Simultaneously, they explicitly move away from the speculative spirit because their profession of faith is clearly logicist: for them, the standard condition of rationality is the possibility of translating in a formal-logical language, which leads them, against Hegel, to transform the dialectical negative in a manner that consists of making it disappear. The artificial character of their project shows that this magnificent construction has an "art for the sake of art" side to it, of which we could say that it attests to the simultaneously ethereal and indecisive character of their wish to move beyond the historical conflict of the two dialectical and analytical rationalities. This is revealed, moreover, by a certain primacy of syntax over semantics, that is to say, an indetermination at the semantic level that we indirectly established in the 2010 study.

67 Barot 2010

68 In French, "opérateur de deposition" and "opérateur de relèvement".

As for Da Costa and Priest, they are at first less Hegelian because more distanced from his speculative literality: they do not seek to formalize the movement of the negative, but to show evidence of the fact that contradictions, as untrivial unity of contradictory statements, are, with certain conditions, logically thinkable. But simultaneously, their profession of faith is anti-logicist: their goal, in any case in Priest, is not so much to guarantee the rationality of Hegel by showing that he can be duly formalized, but to draw lessons from the fact that Hegel is right for their logico-mathematical domain, namely that there are, in reality, contradictions or related configurations, that we should accept this fact, live with these contradictions-paradoxes: giving them currency in mathematical logic is only driving in nail. This time, contrary to Doz-Dubarle, we see that paraconsistency, especially in Priest, expresses a strong empirico-metaphysical proximity with Hegel. (3) Because of that, they are more convincing than Doz-Dubarle in that they make their apparatuses work and produce results, unlike a quasi-aesthetical construction: paraconsistency produces knowledge. In other words, the formalization of dialectics is useful for science, whereas in Doz-Dubarle, it ratifies the scientific model against dialectics, by pretending to do this for the sake of dialectics. One of the points that highlight this big divergence is, on the one hand, the fact that tricky questions of logic and mathematics, like those of "their" philosophy, are approached and worked on head-on, and, on the other hand and correlatively, that there is a big work of semantics in paraconsistency, in the technical sense of plurivalence: {T, F, P}, in the metatechnical sense of a teleological conception of truth founded on a monist metaphysics, things that are merely sketched by Doz and Dubarle.

This does not prevent the Priestian operation to be, as much as that of Doz-Dubarle, the sign of a pseudo-dialectical victory. It makes the negativity disappear as well. From a Hegelian point of view, the unity of contradictions is a result posed from the movement of the negativity, and it is the dynamic work of this unity that leads it to the *Aufhebung*, their simultaneous preservation and abolition as such. It is because the negativity is internal to a determination that the latter can pass into its contradiction and unite itself with it. Yet, paraconsistency deals with, in Priest but also in Da Costa, the passage only conceptually and speculatively: the only thing with which they deal logically is the result. This amounts to hypostatizing, at the logical level, the result with regard to that from which it results: to stiffening it, there again, in exteriority, by axiomatically characterizing it, and by stipulating the analytical modes of its manipulation. Priest does try to smooth out the passage from the ontological to the syntactic via a semantic theorization riding two horses

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at once. This does not prevent the new paraconsistent negation from being fixed, at the logical level, as an operator formally independent from that on which it bears, and this forbids us from thinking paraconstent contradiction as an internal scission of a semantic unity: the intensional foundation of this unity is extra-logical. That is how the properly logical unity of contradictions remains the fruit of the combination of exterior elements.

To sum up, these two formalizations make the negative suffer the same treatment: to formalize it, it is necessary to abolish it as dynamism of interiority being at one with the process of actualization, and to fix it as an object or an operator formally independent of the "content" on which it bears: this contravenes, by principle, its speculative signification.

Here, formalizing the negative is making it disappear, by imposing a condition of manipulable exteriority on it, thereby destroying its interiority and its procedurality.

3.2. Returning to the Intertwinement of the Layers of the Problem

In a way, with regard to what we could keep in mind from Doz-Dubarle, the spirit of the formalization initiative seems to be reversed with Priest. Whereas in Doz-Dubarle the formalization of dialectics was supposed to attest to and extend its rationality, in Priest it is the reality of dialectics that attests and enjoins to its rationality by making it logically explicit. In other words, in Priest, the operation of the formalization of dialectics relies, finally, on that which, in Doz-Dubarle, it was supposed to guarantee the legitimacy.

This circularity, as temporalized discursive and historical process, refers, evidently, to a spiral shaped structure, and that, we have seen it, characterizes in particular that of the formalization of dialectics. In other words, the formalizations of dialectics are (1) an example of the general problem of formalization understood as a traditional knot in the logico-mathematical scientificity at large; (2) a particular historical illustration of a particular conflict of rationality which illustrates, itself, the traditionally clashing structuration, the traditionally paradoxical regime of scientific progress; (3) a way of formally characterizing the paradoxical regime of scientific progress[69]. These levels are embedded and mingled around a same problem, the historicity of scientific like that of conceptual objectivity. The spirality, objectively highlighted on the occasion of or

69 And this rising reflexivity is again redoubled when paraconsistency is firmly used to formalize the regime of historicity appropriate to this intermingling. This is what is tried by Woods 2003: modeling the conflictual structure of the process of the progress of scientific discovery, understood as the strategy of identifying and resolving conflicts.

concerning dialectics, illustrates the dialectical and historical spirality of objectivity in general, and this dialectical historicity of objectivity is expressed and embodied in conflicts between theories, schools, and actors, that is to say *materially*.

We saw that it was necessary, for Priest, to invoke "semantic closure" so that he may speak not only of paradoxes but also of contradictions in the strict sense, i.e. intensional from the logical point of view. Yet, semantic closure belongs to natural languages. Priest insists on the naturality of semantic closure, taken then as the indication of the mundane reality of such a closure: there is nothing beyond language just as and because there is nothing beyond the world or history, space and time. Here, the founding monism is the thesis of the unity of the world, of history and of reason, of the real as a natural-historical process, and in it of thinking. And effectively: how can we say, fundamentally, that two things are contradictory if their relationship does not express their community? Only determinations having the same origin, membership or nature can be really contradictory. This is the Hegelian thesis: there is negativity because, contrary to Plato or Lautman, the Other emerges from the Same. And yet, the cosmological unity in Hegel is the unity of the Concept, that of the self-realizing universal, of the infinity working in the midst of the finite: such is the foundation of idealism. Marx deconstructed this idealism by showing the unity of history and nature, with the human history as its real natural history, as unity and totality in becoming translating itself by class struggle, i.e. the work of the contradiction between work and capital, in other words between work and itself via the mediation of the social and natural world: thus the two examples employed by Priest, after the one of movement.

But if Marx challenges the idealist foundation of monism in Hegel, he does not found this monism: he does not really establish, does not demonstrate, as materialist, this monism conditioning the possibility of the existence of real contradictions. This is the meaning of the main critique addressed by Sartre to Marx and to Marxism in his *Critique of Dialectical Reason*: if history is a totalization, i.e. one (even if its meaning is out of reach), then Marx is right. In other words, Marx is practically right, but that which theoretically founds this practical reason is not explicit in Marx: thus, as materialist, it is necessary to reactivate it by qualifying once again the Hegelian operation of founding the unity of the real. It is therefore necessary to establish under what conditions real contradictions can exist: Sartre tells us that the major corollary of the concept of contradiction is that of totalization. Establishing that history is one and one totalization, it is giving oneself the means to demonstrate that contradictions are not ways of talking, but forms and structures

immanent to society and history. This is the goal of the second volume of *Critique of Dialectical Reason*.

Now it is evident that this necessity of refounding the unity is itself a historical necessity. It is therefore necessary, now, to articulate what is at stake in monism and historicity by showing that they are one. But it will be especially interesting to show this at the very heart of the determination of the sense of the problem of the formalization of dialectics, and not as a mere extension to which the latter would lead, as a beyond of itself.

4. Outline of the Politico-historical Sense of the Formalizations of Dialectics. Second Broadening of the Problem

Given that, naturally, what I have done so far has only dealt with two types of formalizations of dialectics, I could draw from it not real, but particular conclusions. This is why it is necessary that we pursue the examination based on other examples of formalizations. But as it is, not as proofs but as suggestions in order to contribute to the debate, I will allow myself to broaden and to put into perspective, in the following remarks and by means of an outline of a politico-historical interpretation of the affair, the pseudo-dialecticity verdict put forward above. At the risk of being repetitive, but in order to limit as much as possible the risk of missing indispensable mediations, I shall begin by clearly recapturing the way I have tried to construct the problem.

4. 1. From What is at Stake in Formalization to the Specific Issues of the Formalization of Dialectics

The logico-mathematical production *stricto sensu* has been required, since more than a century, to be regimented in formal systems which have become, if not the whole of objectivity, at least the guarantee of its logico-mathematical character, i.e. quite simply of its scientificity. That has not always been the case in history, but the idea of reorganizing on a purified, as unequivocal and systematic as possible, basis, by short-circuiting the epistemological obstacles of intuitive or empirical kinds, is not new: from that point of view, independently of the difference of nature between the Euclidian axiomatic and the Hilbertian axiomatic, the objective, the general purpose, and the passage to formalization in the contemporary sense, the specific, that is historically situated, form that the pursuit of this objective has taken is comparable. Whence the question: under what conditions, on what occasions, and based on which

purposes, and what, do we formalize? All formalizations are committed to giving exactitude to that which is not or is not sufficiently exact, and tend to reduce certain previously experimented conceptual problems to technical and calculative questions. But if we keep in mind Gödel's 1931 result, all new formalizations conjure up, in their own midst, new problems that they are not apt to settle, i.e. through which they stumble over their relative and limited character, that is, over their own limits; and these limits are always, in one way or another, the expression of the existence of a conceptual or speculative residue which is irreducible to mere technicality.

The movement of formalization as such is precisely that by which the existence of a stratum simultaneously constitutive of the objectivity of mathematical and irreducible to technico-formal procedures is certified. That is why the multiple adventures of the Gödelian result, from Lautman to paraconsistency, invite us to reread, as a tool, the previous history of the logico-mathematical theories as the conjoint history of attempts at instituting the epistemological rupture, and the impossibility, probably irreducible, of successfully completing these attempts.

The object of the logico-mathematical praxis is therefore structurally unclear: that of which it is responsible goes beyond it, its "object" is not reducible to "its objects". It is this excess of the object that, in so far as it attests to the irreducibility of the speculative to the technical and forbids all forms of positivism (and positivism is even more miserable when it is implicit), blurs, and even abolishes, at one moment or another, the frontiers between the philosophical and the mathematical. Since Plato, "dialectics" at the same time says and baptizes this excess of mathematics over itself, in its own midst, this beyond of itself, and tries to characterize the conditions and the rational place of this diction. From this point of view, dialectics is (1) the major philosophical discourse, in history, of the impossible self-foundation, and correlatively of the impossible self-formalization of the logico-mathematical, and (2) the kernel, starting with Hegel, of the discourse of the historicity of the latter's objectivity, i.e. of the self-corrective and continued dynamic of the combinatorial of its different kinds of foundations.

When this dialectics itself starts to be submitted to formalizing attempts, the problem is enriched with an additional level and signification, which accentuates the *historical* character of the problem of mathematical objectivity. If, on the one hand, dialectics is the discourse of the irreducibility of the enigmas of mathematics to their technical theorization, and if, on the other hand, the problem of formalization is traditionally a prism, a privileged occasion, for examining the stratification of mathematical objectivity, it is only with the attempts at

formalizing dialectics that these two adventures become one and the same adventure: these attempts come to conjoin and telescope, thirdly, the first two problems, and thereby produce a new, which reveals the rising reflexivity, representative of a certain historical stage, of the first two problems.

4.2. Elements for a Radical Historicization

The initiative is philosophically problematical, at the very least paradoxical, and as technically passionating as defective from a Hegelo-Marxist point of view. But it is necessary to understand its motivations, a concern for legitimization on behalf of the dialecticians, an unrelenting willingness for capturing that which eludes on behalf of the mathematicians, but also to understand that which renders possible these motivations. Evidently, this concern and these conditions are historically contextualized. Not only the problem of formalization is never posed outside of the particular historical experience of a problem that resists and insists, and arouses its deployment, but here, in the case of dialectics, we are faced with an entirely new, symptomatic and historical, paradox.

4.2. 1. Two Historical Conditions of the Problem

Imagining the manifestation of this formalizing will was not possible before

> (1) The duality analytical reason / dialectical reason losing its complementarity face (Plato) to assume, with Hegel, that of rivalry. As the first necessary condition of emergence of the problem, the duality of rationality should take a conflictual form, and this conflictuality, magisterially elevated to the concept, and kept, simultaneously, in suspense in the speculative order by Hegel, is that of the booming capitalism of the 18th century, worked by an explosive antagonism.
> (1) But there is also a second necessary condition. It was necessary, moreover, that this rivalry, understood as mutual condemnation of irrationality (dialectical reason because it accepts real and discursive contradictions as fertile principles, analytical reason because it mutilates the complexity of the real), be considered, at least in the spirit, as soluble without reductionism.

In other words, it was necessary (i) that the criteria of legitimization provided by the logico-mathematical manage to find, under certain

conditions, grace in the dialecticians' eyes, and (ii) that the criteria of legitimization promoted by the dialectical idiom manage, under certain conditions, to find grace in the logicians' eyes. Now, this second double condition is proper to the 20th century. Sub-condition (i) has been satisfied by a growing concern and awareness, among the scientific workers and/or their epistemologists, of the historicity of objective knowledge, of its nonlinear and non-mechanical, but critique and "recurrent" temporality: the crisis in the foundations of the first half of the 20th century, the contradictions of set theory, the limitations brought about by the incompleteness, but also the paradoxes of space and time brought to light by wave mechanics, then quantum mechanics and general relativity, have promoted, in spite of its variegated and complex nature, the acceptation in the scientific and epistemological field of the idea based on which reality is made, if not of contradictions, at least of paradoxes, of tensions, to which the dialectical idiom is certainly adapted. The pregnancy of the dialectical and historicist banner in the post-neo-Kantian French School, and a little bit later the historicist currents, even if in minority, of the Anglo-Saxon field itself, like the one represented by Kuhn, bears witness to this process.

With regard to sub-condition (ii), it was necessary that the will to formalization in the strict sense be completely integrated, even among the dialecticians, as constitutive, if not exclusively, of scientificity: the fact that a certain opening, a certain flexibility, has been attached to the logico-mathematical model of scientificity (totally absent, besides, from logical neopositivism, which is why it fought against it such forcefully), is that which has rendered this revival of legitimacy possible in their eyes[70]. This is why the formalizations of dialectics could not be born in any moment other than after the Second World War, during the second half of the 20th century.

4.2. 2. Diagnostic Politicization

My working hypothesis, that here I will only briefly sketch, is that these attempts, beyond this specific contextuality, have constituted a local and ethereal path to get out of the immobilism of a cold war between analytical and dialectical reasons, of the ossification of an antagonism between "a western rationality" and a "dialectical materialism", given that both are characterized by their historical failure at constituting themselves as the whole of a rationality of thought and of the society.

70 This is something that Marcuse does not take into account, probably out of ignorance, but, in his defense, because the ideology that he criticizes is absolutely disconnected from these marginal subversions of the (neo)positivist model.

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These formalizations show and give evidence to a certain state of culture and thought which has tried to unite, once again, but prudently, what had appeared to it as two excessively and damagingly entrenched camps. But if they are the expressions of a paradoxical historical moment from the point of view of their immediate theoretical significations, they stand out, on the contrary, as the non-paradoxical representative expressions of a social, intellectual and political need, induced by a certain state of history: getting out of the cold war by reconciling the opposites. On the one hand, if we leave aside their technical and conceptual results, we can defend, in them, the willingness to reunify the rationality without unduly homogenizing it. But on the other hand, once we take their results into account, we cannot but call into question their pretension, i.e. their way of envisaging this reunification: the dissolution of the negative by its institutionalization that they effectuate likens them to an indirect form of social-democratization of the problem of communism and of the revolution.

If the goal, as we have seen it, is not to evade "inconsistency" but to channel it by localizing it for avoiding that it affect the whole system, are we not dealing with an initiative of hijacking? Does it not amount to accepting the contradiction precisely to remove its explosive character?

This bundle of initiatives is therefore a certain face of the form of capitalism's objectivity during the second half of the 20th century: similar to the bourgeois arts of the "affirmative culture" the way Marcuse understands them, they constitute theoretical forms in which the contradictions of the society have partially found a way of expressing themselves. But if terms such as "non-standard" or "non-classical" do correspond to these initiatives, by meaning heterodox, heterodox is far away from the signifier oppositional. It will be necessary therefore to dig, in the future in particular, this hypothesis: that the axiomatic-set theoretical paradigm of Bourbaki has constituted the principal, dominant, orthodox and recalcitrant from of objectivity, as much of paradoxes as of contradictions, of the statist imperialist capitalism of the 20th century[71]. I would suggest that the formalizations of dialectics constitute an "alternative" micro milieu to this dominant paradigm, but working on the same ground, i.e. with its main pre-requirements, and leading to the results that it expects.

71 It is not surprising, retrospectively, that Jean Dieudonné, the "philosopher" of Bourbaki, *de facto* leaves meticulously out, in his reiterated homage to Lautman, precisely all that was related to dialectics in the latter.

4.2. 3. Prospective Politicization: the Unlocalizable Character of Communism and Formal Destinies of the Negative

Let us conclude with certain prospective remarks. On the one hand, we could generalize the topic by saying that the negative is consubstantially stubborn towards formalization, that all projects of institutionalization come up, by definition, against failures, and that therefore all projects of this kind are intrinsically doubtful and liberticidal. Sartre or Marcuse would possibly go in this direction. But if we can agree on the foundation of such an impossibility on the side of the negative, that should not make us be biased against the inventiveness to come of the human species. Imagining the possibility of a formalization of dialectics capable of satisfying the negative as negative is not more absurd than imagining an institutionalization of communism as the realized association of free men having abolished social classes, without presupposing, at any level whatsoever, a teleological and linear history. If we maintain the purely analogical character of both problems, we can effectively think that the soluble or insoluble character of one of the two problems does not harm, by any means, the soluble or insoluble character of the other. If we affirm, on the other hand, that the "epistemological" problem is only a particular expression of the politico-historical problem, then we are dealing with a unique problem only. The possible Sartro-Marcusian sanction leads to a difficulty: the resolution of the problem tends to become an irreducible point of flight, a pure and simple *regulative* idea.

Do we really have any proof to support the affirmation based on which all institutionalizations carry in themselves a tendency towards ossification, towards inertia, towards the repression of the negative? Or does it remain possible to imagine forms of institutionalization of the negative which would have the virtues of stability and rational regulation without confining it to a sandbox? And, then, which tools and practices can constitute the kernel of the revolutionary transition which would lead, as Marx, Engels, Lenin and their consorts used to hope, to such an institution of freedom? The "the dictatorship of the proletariat" as a residual state, emerging from the destruction of the bourgeois state, working towards its own withering away, as state and anti-state at the same time, in short, as a transitorily contradictory institution, is it condemned to failure? The preconceived view of revolutionary materialism consists of saying that the dialectics of the praxis of humans to come is not written in advance, in its successes like in its failures, that a test, an ordeal, is not a proof[72].

72 Cf. Barot 2011

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Two conclusions therefore. First of all prospectively: nothing prevents, in principle, the realization of a formalization of dialectics. But the good form of the negative, just like the real organization of authentic communism, are yet to be found. Then "diagnostically": the cold war is behind us: the USSR no longer exists, its *diamat* neither. But that does not mean that the stage of society has changed, quite the opposite: capitalism is still there, more than ever. The new attempts at formalizing dialectics are affected by a profound ambiguity: they keep on trying to legitimize the revolutionary principle with the means of the dominant rationalism, but this remains a fundamentally conservative goal, because it aims at channeling and institutionally regulating the aforementioned principle which consists of nothing more or less than abolishing it. Today, this ambiguity remains the element restricting what is most essential in the left-wing practices and thoughts. It is only by pursuing the diagnostic examination of their tensions, and by concretely working, by contrast and directly, towards such prospective aims, that the former can be surpassed, vigorously[73], by the latter at all levels, including at those which are apparently most immunized against all politicization, and which are dealt with by the formal sciences. What is at stake in this affair, *in fine,* is to remember very well the reason why the essence of dialectics, in its materiality and its history, as emphasized by Marx in his 1873 postface to the republication of the first volume of *Capital*, is "critical and revolutionary".

Translated by: Sina Badiei

73 I have already invoked, in the study from 2010, the necessity of examining in detail Alain Badiou's proceeding in *Logics of Worlds* from 2006, which contains nothing less than a formalization of "dialectics" by means of a particular segment of category theory, and of a revisited conception of dialectics. I can only reiterate, for want of anything better for now, this necessity, just as it would be necessary to deal with the synthesis and the proposed readings of the problem by Marconi 1979, as well as to deal with the works of the Polish and Russian schools, in particular the works of Ilyenkov 2008.

Bibliography

Aristote 2008, *Métaphysique*, Paris: Flammarion

Bachelard, Gaston 1927, *Essai sur la connaissance approchée*, Paris, Vrin

Barot, Emmanuel 2002 "Dialectique de la nature pensante: la construction de la cognition mathématique", *Philosophia Scientiae*, n°6 (1), 2002

---------- 2=004, *L'aventure mathématique de la dialectique depuis Hegel*, Paris X – Nanterre, France, PhD thesis

---------- 2009a, *Lautman*, Paris: Belles-Lettres

---------- 2009b, La crise des fondements des mathématiques fut-elle révolutionnaire? (Sur l'avènement du paradigme axiomatico-ensembliste)", in O. Bloch (dir.), *L'idée de révolution : quelle place lui faire au XXIe siècle?*, Paris, Presses de la Sorbonne, 2009b

---------- 2010, "La dualité de Lautman contre la négativité hégélienne, et le paradoxe de leurs formalisations, *Philosophiques*, Volume 37 , Number 1 , Spring, 2010

---------- 2011, Marx au pays des soviets, available online at: https://www.contretemps.eu/compte-rendu-marx-au-pays-des-soviets-demmanuel-barot/

J.-Y. Béziau, Jean-Yves 2001, From Paraconsistent Logic to Universal Logic, *Sorites*, n° 12, May

Da Costa, Newton 1997 *Logiques classiques et non-classiques. Essai sur les fondements de la logique*, Paris, Masson

Cassou-Nogues, Pierre 2004, *Gödel*, Paris, Belles-Lettres

da Costa, Newton C.A, 1997, *Logiques classiques et non-classiques. Essai sur les fondements de la logique*, Paris: Masson

Dixsaut, Monique 2001, *Métamorphoses de la dialectique dans les dialogues de Platon*, Paris, Vrin

Marquit, Erwin, 1990, "A Materialist Critique of Hegel's Concept of Identity of Opposites," *Science and Society*, 54, no. 2 summer.

Feferman, Solmon 2000, in S. Feferman, H. M. Friedman, P. Maddy & J. R. Steel, "Does Mathematics need New Axioms?", *Bulletin of Symbolic Logic*, 6 (4

Kitcher, Philip 1984, *The Nature of Mathematical Knowledge*, New York/ Oxford, Oxford University Press

Ilyenkov, E. V. 2008, *Dialectical Logic. Essays on its History and Theory*

Lautman, Albert 2006, *Les mathématiques, les idées et le réel physique*, Paris, Vrin

Marcuse, Herbert 1968l *Raison et révolution. Hegel et la naissance de la théorie sociale*

Marconi, Diego 1979, *La formalizzazione della dialettica. Hegel Marx e la logica contempsoranea*, Torino: Rosenberg & Sellier

Mouloud, Noël 1989, *Les assises logiques et épistémologiques du progrès scientifique*, Lille: Presses Universitaires du Septentrion

Priest, Graham 1979, The Logic of Paradox, *Journal of Philosophical Logic*, 8

Norman, J, Priest G. & Routley, R.(eds) 1989a, *Paraconsistent Logic. Essays on the Inconsistent*, Munich: Philosophia Verlag,

---------- 1989b, Dialectic and Dialetheism, *Science and Society*, vol. 53, n° 4.

---------- 1990, Was Marx a Dialetheist?, *Science and Society*, vol. 54, n° 2, hiver 1990

---------- 1999, What not? A Defense Of Dialetheic Account Of Negation", In: Gabbay D.M., Wansing H. (eds) What is Negation?. Applied Logic Series, vol 13. Springer, Dordrecht

---------- 2006b, *Doubt Truth To Be A Liar*, Oxford: Claredon Press

D. Batens, D, Mortensen, C, Priest, G, & Van Bendegem, J.-P. (eds) 2003, *Frontiers of Paraconsistent Logic*, London: Research Studies Press.

---------- 2006a, *In Contradiction. A Study of the Transconsistent*, Oxford: Clarendon Press

---------- 2006b, *An Introduction to Non-Classical Logic*, Cambridge: Cambridge University Press

---------- 2006, *Doubt Truth To Be A Liar*, Oxford, Clarendon Press

Plato 1997, "Republic", in *Completed Works*, Indianapolis/Cambridge, Hackett Publishing Company

Rivenc, François 2005, *Introduction à la logique pertinente*, Paris: PUF

Shapiro, Steward 2002, Incompletness and Inconsistency, Mind, vol. 11, 444, October

Tarski, Alfred 2009, *La conception sémantique de la vérité et les fondements de la sémantique*, in D. Bonnay & M. Cozic (éds), *Philosophie de la logique. Conséquence, preuve et vérité*, Paris: Vrin

Woods, John 2003, *Paradox and paraconsistency: Conflict Resolution In The Abstract Sciences*, Cambridge University Press

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Concrete-in-Thought, Concrete-in-Act: Marx, Materialism and the Exchange Abstraction

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Abstract: Marx's distinction between concrete-in-thought and concrete-in-reality does not invoke a conceptual or empirical difference but a *difference-in-act*. This difference is verified in social practice rather than in thought. The actuality of practice verifies that of thought without there being a metaphysical correspondence between them. While thought can adequately represent the structure of practice, there is no similarity or resemblance between the structure of thought (what is concrete-in-thought) and that of practice (concrete-in-reality). What is concrete-in-reality is a practical act whose nature does not reveal itself either to those executing it or to the theoretical consciousness that takes the consciousness of practitioners as its starting point. This has ramifications for Marx's critique of reification as well as his distinction between 'living' and 'dead' labour. I argue that Marx's critique of reification is epistemological, not ontological, and that the contrast between objectivating and objectified labour is not a metaphysical contrast between authentic and inauthentic existence or between lived and represented experience. Rather, it is a formal contrast between unconscious (unvalidated) practice and conscious (socially validated) activity. Nevertheless, this contrast has an ontological premise: the actuality of the exchange abstraction depends upon an act that is not actually exchanged (socially valorized).

Keywords: Marx, materialism, critique, abstraction, concrete-in-thought, practice, exchange.

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Introduction

Marx's is a materialism of abstraction. Capitalism is a system of real abstractions: commodity, value, labour, money, exchange, et al. In contrast to thought abstractions generated through intellection (such as humanity, right, justice, beauty, etc.), real abstractions are generated through social practices. Where the unity of thought abstractions defies spatiotemporal localization because it is that of transcendent generality, the unity of real abstractions defies localization because it is spread out across space and time. Real abstractions are immanent without being particular, abstract without being transcendent. Thus money, for example, is represented by ostensible particulars (whether coins, notes, or digital encryptions) but is not itself an ostensible particular. Yet it is not a conceptual artifact; its attributes and functioning do not depend on intellection. It is concrete but not ostensible.[1]

1 I say "ostensible" rather than "localizable" because specific currencies, such as the dollar or the euro, possess temporally localizable properties (of magnitude or equivalence) even though

Concrete social activity generates abstractions in consciousness. These include: the individual, property, productivity, population, the market, society, nature, nation-state, law, right, et al. They can be contrasted with the critical form-determinations through which Marx diagnoses these thought abstractions as the ideological masks of real abstractions: commodity, money, labour, value, production, exchange, et al. Uncovering the form-determinations of the capitalist totality reveals how a category like 'society' misrepresents this contradictory totality as a concrete whole.

Maintaining the reality of abstractions while anchoring them in social practices, Marx's materialism breaks with traditional metaphysics and epistemology. This break is radical but not absolute: unlike Nietzsche for instance, Marx does not try to dissolve the dialectic of truth and semblance into a play of forces (competing wills to power).[2] It is Feuerbach who gives Marx his lead in breaking with philosophy's speculative consummation in absolute knowing. For Feuerbach, speculative transcendence becomes immanent as the fusion of the sensuous and the supersensuous, the phenomenal and the noumenal: "[W]e need not go beyond sensuousness to arrive, in the sense of the Absolute Philosophy, at the limit of the merely sensuous and empirical; all we have to do is not separate the intellect from the senses in order to find the supersensuous—spirit and reason—within the sensuous."[3] The sensuous fusion of sensuous and supersensuous is realized in human being. The essence of being human is communality and the sensuous root of communality lies in the interpersonal relation (as opposed to Kantian intersubjectivity).[4]

these properties may not be phenomenologically accessible by their users.

2 To the extent that it disregards distinctions between levels of explanation (between the physical and the biological, the biological and the psychological, the psychological and the historical, the historical and the cultural), Nietzsche's invocation of 'forces' in his attempt to overcome both transcendental (Kant) and speculative (Hegel) philosophy ends up miring him in psychologism and biologism. For an illuminating reconstruction of the neo-Kantian context of Nietzsche's naturalism, see Peter Bornedal *Nietzsche's Naturalist Deconstruction of Truth*, Rowman and Littlefield, forthcoming. Marx, by way of contrast, espouses science and affirms the continuity between humanity and nature while rejecting 'worldview' naturalism, i.e. naturalism as a metaphysical ideology. He draws critically on Hegel and Feuerbach to overcome the limitations of both logicism and anthropologism. The logicist equivalence between the real and the rational is subverted by Feuerbach's rooting of spiritual self-externalization in human sociality. But the anthropological equation of sociality with communality is subverted by using the dialectic of essence and appearance to explain how sociality does not appear to itself as it is in itself.

3 Feuerbach 2012, p. 504.

4 Feuerbach 2012: 529.

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Marx takes over Feuerbach's sensuous immanentization of speculative transcendence. However, for Marx, the social relation is irreducible to the interpersonal because it is rooted in social practice, which operates behind the back of consciousness, whether personal or interpersonal. Sensuous practice—what we do without knowing that we are doing it—is the immanent but unconscious medium of human being. Sensuous social practice is not an attribute of human being; human being is an attribute of sensuous social practice.

Attempts to absolutize Marx's break with philosophy end up recoding it philosophically by appealing to false concretions (consciousness, the body), indeterminate abstractions (utopia, redemption), or more often than not, a theological fusion of both. Precisely because it eschews undialectical absoluteness, Marx's break with traditional philosophy can only be properly grasped through the resources of philosophy. It resides in a double inversion: Marx overturns rationalism's subordination of the sensible to the intelligible while simultaneously overturning empiricism's subordination of the intelligible to the sensible. Thus Marx 'twists free' of both rationalism and empiricism by suggesting that it is the sensible that is inapparent and the intelligible that is apparent. The critique of political economy follows from this double inversion, together with Marx's claim that what is concrete in reality can only be grasped through the medium of abstraction. The crux of this double inversion resides in the exchange abstraction and the essential split it generates between the reproduction of value and the reproduction of sociality. While *Capital* develops the ramifications of this inversion, it is already prefigured in the tenets of historical materialism. I will recapitulate them here in the form of ten theses derived from *The German Ideology* and the *Theses on Feuerbach* (this list is not supposed to be definitive; it is intended merely as a useful heuristic):

Ten theses of historical materialism

1. Human social production is the ultimate determinant of ideation.

2. Human activity is determined by existing conditions but also produces new conditions. It is this circuit of conditioned and conditioning activity that is the empirically (as opposed to logically) real starting point for materialist theory. It is concretely sensuous as the medium of practice; it is not an abstract datum or "matter of fact" of the sort favoured by philosophical empiricism.[5]

5 See Feuerbach 2012, pp. 484-486.

3. Forces of production determine social relations but are also determined by them in turn.

4. The development of the division of labour determines (a) the development of forms of property, (b) the contradiction between theory and practice, and (c) the contradiction between particular and common interests.

5. The difference between humans and other animals is materially produced by human activity; it is not a metaphysical or transcendental difference. Humans differentiate themselves from other animals in practice before distinguishing themselves from them in theory.

6. The history of humanity, including the history of humanity's relation to nature, is the history of social (re)production. No sensuous datum is merely given; it has always been socially produced (i.e. mediated by a system of social relations, not a concept).

7. The social relation is the source of the materiality of human consciousness.

8. Consciousness is the "inverted reflection" of real social relations. The limitations of material production and social relations impose this inversion upon consciousness.

9. Historical materialism is the science of history to the extent that it proceeds from the real premise of sensuous productive activity as the source of ideological representation, including that of empiricist and idealist history.

10. Practice establishes the truth, i.e. the effectiveness or actuality, of thinking.

From ideological inversion to fetishistic transposition

I want to begin by considering thesis 8: sensuous productive activity appears inverted in ideation. The limitations of our material activities and social relations impose limits upon our understanding of that activity and these relations. Thus the critique of ideology starts from the critique of the primacy of consciousness. The "historical life-process" (the production and reproduction of the means of existence) makes human social relations appear upside-down in consciousness:

> If the conscious expression of the real relations of these individuals is illusory, if in their imagination they turn reality upside-down, then this in its turn is the result of their limited material mode of activity and their limited social relations arising from it. [...] Men are the producers of their conceptions, ideas, etc., that is, real, active men, as they are conditioned by a definite development of their productive forces and of the intercourse corresponding to these, up to its furthest forms. Consciousness [*das Bewusstsein*] can never be anything else than conscious being [*das bewusste Sein*], and the being of men is their actual life-process. If in all ideology men and their relations appear upside-down as in a camera obscura, this phenomenon arises just as much from their historical life process as the inversion of objects on the retina does from their physical life-process.[6]

If ideology (religious, juridical, economic, philosophical, scientific) is the 'inverted image' of social existence, understood as circuit of conditioned and conditioning productive activity, then this inversion cannot be confined to single dimension of representation (e.g. spatial orientation, up-down). Marx's 'inversion' of the metaphysical subordination of sensuous appearance to supersensuous reality does not just re-subordinate the latter to the former. The critical torsion proper to the critique of political economy implies that the sensuous (forces and relations of production) is inapparent and that the intelligible (consciousness as representation of these forces and relations) is apparent, so that the intelligible is the distorted form of appearance of inapparent sensuous activity (the activity constituting productive forces and relations).

In *Capital* however, ideological inversion becomes fetishistic *transposition*. The commodity is the juncture of the sensuous and the supersensuous: it is the form in which sensuous relations between producers appear to the producers themselves as supersensuous relations between their products:

> A commodity is therefore a mysterious thing, simply because in it the social character of men's labour appears to them as an objective character stamped upon the product of that labour; because the relation of the producers to the sum total of their own labour is presented to them as a social relation, existing not between themselves, but between the products of their labour. This is the reason why the products of labour become commodities, social things whose qualities are at the same time perceptible and imperceptible by the senses [....] [But] the existence of the things qua commodities, and the value relation between the products of labour which stamps them as commodities, have absolutely no

6 Marx 1998, p. 42.

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> connection with their physical properties and with the material relations arising therefrom. There it is a definite social relation between men that assumes, in their eyes, the fantastic form of a relation between things.[7]

The relation of producers to "the sum total of their own labour" is their relation to the exchange value that relates commodities to each other. As the transposition of social relations among producers into relations between products mediated by the 'spectral objectivity' of value, fetishism is the occlusion of productive social activity in the act of commodity exchange. Consciousness of the individual act of exchange occludes consciousness of its social precondition. Consciousness is necessarily false in the sense that we can only be individually conscious of what we are doing in exchange by *not* being conscious of what we are collectively doing in exchange. The collective practice of commodity exchange is precisely what cannot be intuited or represented from the vantage of individuals engaged in exchange. Exchange is a practical abstraction whose concreteness can only be grasped by abstracting from what appears as concrete from the vantage of individual consciousness. The epistemic index for the primacy of social practice is its misprision in consciousness. Practice is not transparent to its practitioners. Supersensible abstraction (what Marx calls 'form-determination') is the concrete form in which sensuous practice appears to theoretical consciousness, which is the reified and reifying consciousness conditioned by the division of (intellectual and manual) labour.

Two clarifications are necessary at this point. First, Marx's materialism is not soldered to a metaphysics of labour. Labour is not the essence of history because useful work is necessarily misrepresented as valuable labour within a specific historical context.[8] There is no determination of use that does not involve abstracting from the historically specific determination of exchange-value under capitalism.

7 Marx 2000b, p. 473

8 "So far therefore as labour is a creator of use-value, is useful labour, it is a necessary condition, independent of all forms of society for the existence of the human race; it is an eternal nature-imposed necessity, without which there can be no material exchanges between man and Nature, and therefore no life." (Marx 2000b, p.464) Note that while useful labour in general is a transhistorical condition of human life, the specific varieties of useful labour, or what counts as useful labour within a particular society, will be historically variable. Marx does not postulate a set of use-values in-themselves, transcending historically specific social formations. In a capitalist society coordinated around the production and exchange of commodities, the use-values of commodities, i.e. the variety of uses to which they can be put, is shaped in negative by the primacy of exchange-value, which is the first and final cause of their existence.

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Thus there is no use in-itself, no domain of use-values transcending historically specific alignments of production and consumption. Second, Marx is not wedded to a metaphysics of production. Capitalist production is commodity production: the form of production under capital is conditioned by and subordinated to the commodity form. The means of production themselves are composed of commodities. Thus, under capitalism, both production and consumption are subordinated to exchange (to the commodity-form and thereby to value). There is no trans-historical perspective on production, save for what Marx describes as "singling out and fixing" the general features common to historically specific social formations. 'Production in general' is a methodological abstraction, not an ontological category.[9] To hypostatize production and elevate it into a metaphysical principle ("nature is production") is to naturalize a historically specific social category. Since the commodity-form is intrinsic to the categories of 'production' and 'productivity', the logic of production is indissociable from the logic of commodity exchange.[10]

But the practical reality of commodity exchange is not experienced *as* practice within reified consciousness (i.e. the social consciousness subjugated by the commodity form).[11] Thus the reality of collective practical activity can only be indirectly attested to by exposing its symptomatic (fetishistic) misrepresentation both in individual consciousness and the theoretical consciousness that takes its cue from the latter. This is why the critique of political economy is necessary. To grasp the structure of the necessary false consciousness operative in

9 "Whenever we speak, therefore, of production, we always have in mind production at a certain stage of social development, or production by social individuals [...] 'Production in general' is an abstraction, but it is a rational abstraction, in so far as it singles out and fixes the common features, thereby saving us repetition." (Marx 2000a, p.381) Production as methodological abstraction stands in contrast to the hypostatization of production, which often accompanies the naturalization of capitalism. The latter involves a four-step argument, which Marx summarizes as follows: (i) production always requires some instrument of production ("let that instrument be only the hand"); (ii) production is not possible without past accumulated labour ("even if that labour should consist of mere skill which has been accumulated and concentrated in the hand of the savage by repeated exercise"); (iii) capital is ("among other things") both an instrument of production and past impersonal labour; (iv) therefore, "capital is a universal, eternal, natural phenomenon". But this is only true, writes Marx, "if we disregard the specific properties which turn an 'instrument of production' and 'stored up labour' into capital." (Marx 2000a, pp.381-382) These specific properties, unveiled in Marx's analysis, are their status as commodities and their subjection to the valorization process, which is perpetuated by the practice of commodity exchange. But these are social properties, not natural ones.

10 This ontologization of production arguably vitiates Deleuze and Guattari's attempt to align Marx with Spinoza in *Anti-Oedipus* (Minneapolis: University of Minnesota Press, 1983).

11 Lukacs's remains the most powerful and sophisticated account of reification: see Lukacs 1972.

misrepresentation is to identify this falsity as the only veritable index of the social relation, understood as a system of impersonal practices, rather than a set of interpersonal relations. The necessity of falsity points to its inapparent truth. Consciousness is necessarily false: it does not *express* the social relation (the system of impersonal practices) that is its essence; it *represses* it.

The concrete-in-thought

Marx's critique begins with the categories of political economy as expressions of socially necessary false consciousness.

These categories are shown to be results of historically specific conditions and relations of production. What critique reveals however is not the truth of the invisible but the untruth of the visible, i.e. the intelligible. What presents itself to thought as concrete is an incomplete abstraction; but through its incompleteness, this abstraction harbors a symptomatic relation to what is really concrete, the social totality. The structure of the latter, however, is precisely what cannot be intuited or inferred. It does not give itself to consciousness. It is ideologically misrepresented as an aggregate of composite abstractions, which critique must first decompose into their elementary parts before recomposing these parts into a conceptual totality that corresponds to the social totality but does not resemble it:

> It seems to be the correct procedure to commence with the real and the concrete, the actual prerequisites. In the case of political economy, to commence with population, which is the basis and the author of the entire productive activity of society. Yet on closer consideration it proves to be wrong. Population is an abstraction, if we leave out for example the classes of which it consists. These classes, again, are but an empty word unless we know what are the elements on which they are based, such as wage-labour, capital, etc. These imply, in their turn, exchange, division of labour, prices, etc. Capital, for example, does not mean anything without wage-labour, value, money, price, etc. If we start out, therefore, with population, we do so with a chaotic conception [*Vorstellung*] of the whole [*Ganzen*], and by closer analysis we will gradually arrive at simpler ideas; thus we shall proceed from the imaginary [*vorgestellten*] concrete to less and less complex abstractions, until we arrive at the simplest determinations. This once attained, we might start on our return journey until we finally came back to population, but this time not as a chaotic notion of an integral whole, but as a rich aggregate [*Totalität*] of many determinations and relations [...] The concrete is concrete because it is a combination [*Zusammengfassung*] of many determinations, i.e. a unity of diverse elements [*Mannigfaltigen*]. In our thought it therefore appears as a process of synthesis, as a result, and not as a starting-point, although it is the actual [*wirkliche*] starting-point and, therefore, also the starting-point of observation [*Anschaung*] and conception [*Vorstellung*]. By the former method the complete conception passes into an abstract definition; by the latter the abstract definitions lead to the reproduction of the concrete subject in the course of reasoning.[12]

Marx's method of critique comprises two steps: first the decomposition of the abstracted (represented) concrete into its elementary components (simple abstractions); then the recombination of simple abstractions into concretely determined abstraction: the totality of determinations as concrete-in-thought. What is *represented* as concrete-in-reality is an indeterminate whole. What is *reproduced* as concrete-in-thought is a determinate totality. The movement from abstract representation to concrete reproduction is logical not material. Thus it is necessary to distinguish ideal movement from the real *act* of production:

> [T]he consciousness for which comprehending thought is what is most real in man, for which the world is only real when comprehended (and philosophical consciousness is of this nature), mistakes the movement of categories for the real act of production (which unfortunately receives only its impetus from outside), whose result is the world; that is true—here we have, however, again a tautology—in so far as the concrete aggregate [*Totalität*], as a thought aggregate [*Gedankentotalität*], the concrete subject of our thought [*Gedankenkonkretum*], is in fact a product of thought, of comprehension; not, however, in the sense of a product of a self-emanating conception which works outside of and stands above observation [*Anschaung*] and imagination [*Vorstellung*], but of a conceptual working-over [*Verarbeitung*] of observation and imagination. The whole [*Ganze*], as it appears in our heads as a thought-aggregate [*Gedankenganze*], is the product of a thinking mind which grasps the world in the only way open to it, a way which differs from the one employed by the artistic, religious, or practical mind. The concrete [*reale*] subject continues to lead an independent

12 Marx 2000a, p.386.

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> existence after it has been grasped, as it did before, outside the head, so long as the head contemplates it only speculatively, theoretically. So that in the employment of the theoretical method in political economy, the subject, society, must constantly be kept in mind as the premise from which we start.[13]

The difference between the real (social) subject and the thought aggregate (e.g. society), or between what is really concrete and what is concrete-in-thought, is not a difference in thought. But here an obvious rejoinder presents itself: How are we to distinguish between concrete and abstract in thought, and concrete and abstract in reality, without invoking either a metaphysical or empirical difference between thought and reality? Can Marx maintain this methodological distinction without unwittingly reiterating philosophical dualisms (between thought and reality, concept and thing, ideal and real) that have already been dialectically superseded in Hegel's idealism? The distinction between real subject and thought-aggregate cannot be empirically attested to: we cannot *point* to the real subject because the social totality is not an empirical datum. Nor is it accessible from Feuerbach's "absolute standpoint", which is that of the interpersonal relation between 'I' and 'You': Marx's real subject is a locus of impersonal practices irreducible to the interpersonal relation.[14] Conversely, to insist that the difference can be substantiated from a purely rational vantage point is to readopt the contemplative stance whose separation of thought and being, or mind and matter, reflects the division of labour and the separation of theory and practice.

I want to suggest that the right way to grasp Marx's distinction between concrete-in-thought and concrete-in-reality is neither as a conceptual difference nor as an empirical difference but as a *difference-in-act*. What is concrete-in-reality is the totality of impersonal social practices and these practices constitute a system of actual differences that cannot be ratified at the level of consciousness or experience. Thus the fundamental difference, from which the critique of political economy proceeds, is verified in social practice, rather than in experience or thought. Recall the tenth thesis of historical materialism stated above: the truth, i.e., the effectiveness or actuality (*wirklichkeit*) of thinking, is established in practice. My claim is that for Marx, the actuality of

13 Marx 2000a, p.387

14 "The natural standpoint of man, the standpoint of the distinction between 'I' and 'You', between subject and object is the true, the absolute standpoint and, hence, also the standpoint of philosophy." Feuerbach 2012, p. 528.

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practice verifies that of thought without there being a metaphysical correspondence between the actuality of thought and the actuality of practice. Indeed, Marx's point is that while thought can adequately represent the structure of practice, there is no similarity or resemblance between the structure of thought (what is concrete-in-thought) and that of practice (concrete-in-reality). What is concrete-in-reality is a practical act whose nature does not reveal itself either to those executing it or to the theoretical consciousness that takes the consciousness of practitioners as its starting point.

Using and exchanging

Sohn-Rethel roots Marx's distinction between use-value and exchange-value in the socially instituted distinction between the act of using and the act of exchanging. But this social distinction also has an ontological basis:

> The point is that use and exchange are not only different and contrasting by description, but are mutually exclusive in time. They must take place separately at different times. This is because exchange serves only a change of ownership, a change, that is, in terms of a purely social status of the commodities as owned property. In order to make this change possible on a basis of negotiated agreement the physical condition of the commodities, their material status, must remain unchanged, or at any rate must be assumed to remain unchanged. Commodity exchange cannot take place as a recognised social institution unless this separation of exchange from use is stringently observed. [...] Thus the salient feature of the act of exchange is that its separation from use has assumed the compelling necessity of an objective social law. Wherever commodity exchange takes place it does so in effective 'abstraction' from use. This is an abstraction not in mind, but in fact. It is a state of affairs prevailing at a definite place and-lasting a definite time. It is the state of affairs which reigns on the market.[15]

Commodity exchange separates use from value: this is the source of real abstraction. Use is determined by qualitative particularity, exchange by quantitative homogeneity. Using and exchanging are concrete social acts. For Sohn-Rethel, it is their spatiotemporal disjunction (the fact that one cannot exchange what one is using or use what one is exchanging)

15 Sohn-Rethel 1978, pp. 24-25.

that makes abstraction a concrete act. However, the act of exchange presupposes the actuality of the commodity-form: every exchange is an exchange of commodities (buying and selling). But exchange cannot generate commodification if commodification is the condition of exchange (i.e the commodification of labour as wage-labour). Thus the reality of the exchange abstraction implies a difference between exchange-in-act (the actuality of exchange) and the act of exchange. The concrete act generative of abstraction cannot presuppose its actuality. The sociality of the act of exchange is distinct from the actuality of commodification. But sociality is the totality of relations joining productive forces and relations (otherwise it is a metaphysical abstraction). Since the production process presupposes commodification and commodification (the exchange-abstraction) presupposes un-commodified social activity, we face the following dilemma: either try to give a positive account of non-commodified sociality, i.e. of the social relation, at the risk of relapsing into an ultimately ideological metaphysics of sociality (reiterating Feuerbach's conflation of sociality and communality); or we insist that we cannot determine the social relation other than as the negation of commodified sociality. The latter option implies that the un-commodified root of commodified sociality cannot be positively characterised as social.

Labour and valorization

The difference between exchange as act and exchange as actuality underlies the distinction between concrete and abstract labour. The labour that enters into the composition of value has already had its qualitative particularity expunged from it through the act of exchange: "[W]henever, by an exchange, we equate as values our different products, by that very act, we also equate, as human labour, the different kinds of labour expended upon them. *We are not aware of this, nevertheless we do it*. Value, therefore, does not stalk about with a label describing what it is. It is value, rather, that converts every product into a social hieroglyphic."[16]

By inscribing itself into the body of every commodity, the 'spectral objectivity' of value converts every product into a cipher whose sensuous structure is blotted out by its supersensuous signification. But the process in which value acquires substance and inscribes itself into the commodity is also the process in which labour is transubstantiated into value. This is the process in which concretely differentiated human

16 Marx 2000b, p. 474 (my italics).

labour is rendered into what Marx describes as an undifferentiated "*bloße Gallerte*", a 'gelatinous mass'.[17] Yet this rendering process, the reduction of concretely differentiated labour into undifferentiated abstract labour, is already governed by value. Thus value oversees its own substantialization: it perpetually regenerates itself by ensuring that the substrate from which it draws substance, labour, has 'always already' been rendered homogenous with it. This is carried out through what Michael Heinrich calls a "threefold reduction": of individually expended labor-time to average socially necessary labor-time; of individual productivity to socially average productivity correlated with monetary social demand; of differences in kinds and degrees of skill to a socially average type and degree of skill.[18] Thus the abstraction of labour is its social *validation* as value-constituting labour. Abstract labour is both socially valorized and *valorizing* insofar as it has already been appropriated by what Marx calls "self-sufficient value":[19] its "valorizing activity" is carried out on behalf of self-valorizing value.

However, Marx insists, "the value of labour-power and the value which that labour-power creates in the production process, are two entirely different magnitudes."[20] As with every other commodity, the value of labour-power is measured by the socially necessary time required to reproduce it. But in reproducing itself, labour-power creates value in excess of itself, i.e., a value greater than the value of labour-power as measured by the time required for its reproduction. This is what Marx calls 'surplus-value'. Surplus-value is a function of the discrepancy between the value of unexpended labour-power, a value measured by the time required to reconstitute an equivalent of this unexpended potential, and the value generated by its expenditure, which is greater than that of its unexpended state. This appeal to the metaphysical distinction between potentiality and actuality should not be taken to entail the ontologization of labour-power; rather, it follows from its social status as a commodity. The distinction between potential and actualized labour-power is internal to commodified labour; it is decreed by capitalism's metaphysics of value. But it does not map onto the distinction between abstract and concrete labour. The actualization of labour-power, i.e. the consumption of its use-value in the capitalist production process, generates

17 For an insightful discussion of the significance of the expression "*bloße Gallerte*" see Sutherland 2010.

18 See Heinrich 2012, pp.100-102

19 See Marx 2000a, p.409

20 Marx 2000b, p.504

exchange-values in excess of the exchange-value of labour-power. As Peter Thomas points out, this is a consequence of labour-power's exceptional status as the commodity whose use-value is generative of the exchange-value of all other commodities: "labour-power is the only commodity that is not exhausted in the consumption of its particular use-value following exchange. On the contrary, the consumption of the use-value of labour-power has the potential to give the capitalist more exchange-values than the seller of labour-power, the worker, received."[21] But note that the consumption of labour-power is only *potentially* productive of exchange-values greater than its own. This is because, as Thomas observes, although it is exchanged as abstract labour-power, it is consumed as concrete labour. The capitalist's consumption of this concrete labour generates another magnitude of potential abstract value; but its realization as a surplus depends on additional factors exceeding those of production per se (e.g. social demand, the market, etc). More importantly, the difference between the exchange and consumption of labour-power (which corresponds to the difference between abstract and concrete labour) does not unfold in the same dimension as the difference between its potentiality and its actuality. The first difference transects the second but does not overlap with it. While the difference between the actuality and potentiality of labour-power is internal to the exchange abstraction, the difference between exchanging and consuming labour-power bridges the spheres of exchange and use, which is to say, between the abstract and the concrete. This is why Thomas describes labour-power as a "vanishing mediator" between the spheres of circulation and production.[22] However, it is not labour-power qua commodity that plays this mediating role between the spheres of circulation and production, since the commodity-form already presupposes the constitution of the difference between these two spheres, or the difference between exchange and use. Thus the actuality of the exchange abstraction (within which the difference between potential and actual labour-power obtains) is constituted by a concrete act that also establishes the difference between exchanging and using, or circulation and production. The vanishing mediator here is not labour-power but the unvalidated act through which labour is abstracted into its socially validated, value-constituting role.

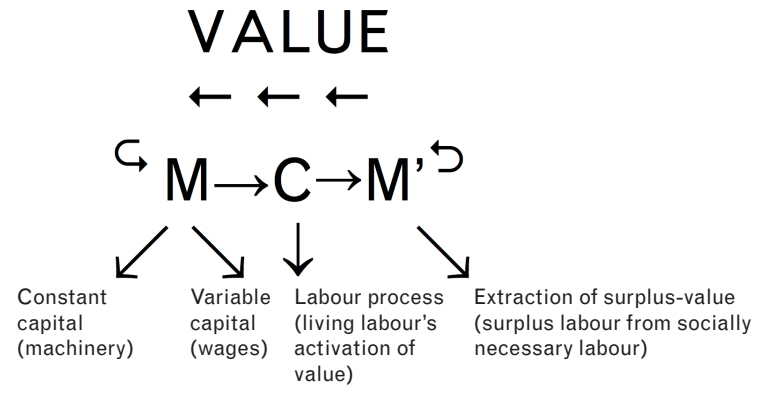
Value is measured abstractly (through abstract labour time) but realized concretely (through concrete labour time). Thus surplus-value

21 Thomas 2010, p.51

22 Thomas 2010, p.52

is a function not only of the difference between the potential and actual expenditure of labour-power, but also of the inequality between the value of labour as measured by the abstract time required to reproduce it, and the value of the products generated through its reproduction when measured by the same yardstick. Whether absolute and obtained by the extensive increase of expended labour-power (lengthening the working day) or relative and obtained through its intensive increase (increasing productivity without lengthening the working day), surplus-value is generated by the unvalorized surplus labour required for labour's self-reproduction. Thus capital extracts surplus-value from labour-power's activation of the value embodied in both constant and variable capital (a value which is itself nothing but a sum of objectified or 'congealed' labour-power). Potential surplus-value is realized as profit with the sale of the products of labour-power and then reinvested in production. In the diagram below, the valorization process proceeds from money (M, representing constant and variable capital), to commodities (C, representing living labour's activation of the value embodied in constant and variable capital), to a greater quantity of money generated through the extraction of surplus-value from living labour's activation of the initial sum of value (M', surplus-value):

Capital as self-valorizing value



In reproducing itself, living labour creates the 'spectral objectivity' of value, to which it is re-subordinated in turn as commodified wage-labour, i.e. socially validated labour. But the difference between commodified and un-commodified labour is neither metaphysical nor sociological: it is the formal difference between socially validated exchange and the unvalidated act of exchange.

Dissociative sociality

In a society where all social validation is governed by exchange, Tony Smith suggests that the actuality of the social relation is necessarily dissociative. Following Smith, I want to argue that since, under capitalism, the social component of dissociation is governed by exchange (commodification), the practical source of commodification (the act of exchange) is necessarily asocial. This is to say that socially validated labour is conditioned by un-validated practical activity. This entails a split between the essence of sociality and the essence of value, i.e. capital. Smith formulates this split as follows:

> Generalised commodity-production must be conceptualised as a set of relationships among things (commodities and money), with value reigning as the 'essence' of these relationships. The underlying truth of this essence (abstract, homogeneous and quantitative value) is adequately manifested in its form of appearance (abstract, homogeneous and quantitative money).[23]

On Smith's account, commodity exchange is the alien form of sociality in the historically specific mode of dissociated sociality. Sociality is the 'essence' of the totality of productive forces and relations. But this essence can only manifest itself as its own untruth (as capitalist 'society'). Dissociative sociality entails that social relations cannot appear as what they essentially are:

> The social ontology of generalised commodity-production is defined by two completely incommensurable Essence-Logics in Hegel's sense of the term. On the one hand, value is the essence commodities must possess to play a role in social reproduction. This essence adequately appears in the form of the money that validates the production of those commodities. But the value of commodities is a reflection of the form taken by human sociality in our epoch, and the money that manifests value is nothing but the fetishized appearance of this quite different sort of essence. Each essence-claim is incompatible with the other; neither can be reduced to or explained away by the other.[24]

This bifurcation in the essence of the social totality follows from capital's being a "contradiction in act": it is compelled to reduce labour time to a minimum while maintaining it as the sole measure of value. Socially necessary labour time is decreased in order to increase surplus labour time, thereby turning surplus labour time into the condition for necessary labour time. Capital's self-reproduction, i.e. its infinite expansion as self-valorizing value, generates the internal obstacle to its reproduction, i.e. the immanent limit to its infinite expansion.[25] Thus, as Endnotes put it, capital is split between its "constant return to itself as true infinity, and its incessant driving beyond itself as false or spurious infinity."[26]

This scission in the capitalist totality, its 'contradiction-in-act', generates the split between the reproductive cycles of capital and of labour-power. Capital reproduces itself through the valorization process, in which necessary labour is constantly diminished to maximize surplus labour and hence surplus-value. At the same time, labour-power reproduces itself by valorizing capital, but in doing so increases surplus labour, making necessary labour ever more dependent upon it. Thus the activation of value in the valorization process depends not on the abstract difference between potential and actual labour-power but on the concrete actuality of the disjunct between (un-commodified, valueless) practice and (commodified, valuable) activity. Interpreted in this way, Marx's contrast between 'living' and 'dead' labour is shorn of its Romantic, vitalist overtones. Adopting Marx's terminology, we could say that it is labour-power as commodity that is subsumed by capital, not living labour as such. But the capitalist class relation compels living labour to commodify (i.e. sell) itself in order to reproduce itself, thereby also reproducing capital:

> Proletariat and capital stand in a relation of reciprocal implication with each other: each pole reproduces the other, such that the relation between the two is self-reproducing. The relation is asymmetric, however, in that it is capital which subsumes the labour of proletarians.[27]

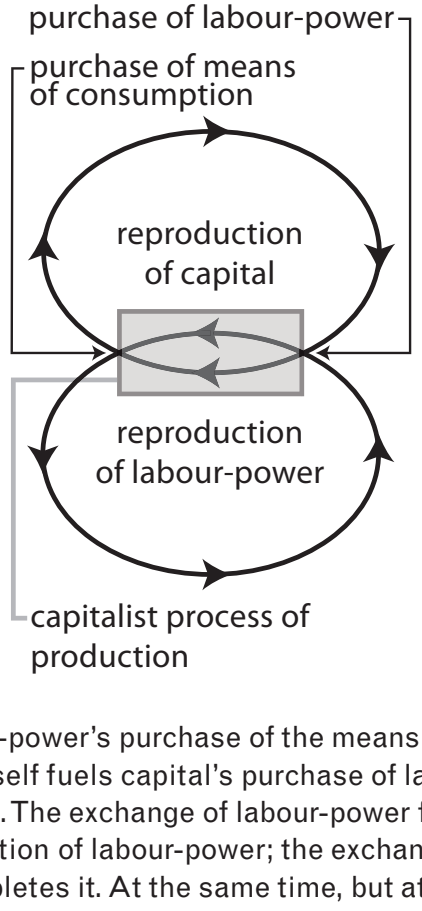
23 Smith 2009, p. 31.

24 Tony Smith 2009, p. 32

25 "Capital is itself contradiction in act, since it makes an effort to reduce labour time to the minimum, while at the same time establishing labour time as the sole measurement and source of wealth. Thus it diminishes labour time in its necessary form, in order to increase its surplus form; therefore it increasingly establishes surplus labour time as a condition (a question of life and death) for necessary labour time." (Marx 2000a, p.415, translation modified)

26 Endnotes 2010

27 Endnotes 2010



Labour-power's purchase of the means of consumption it requires to reproduce itself fuels capital's purchase of labour-power in capital's self-reproduction. The exchange of labour-power for wages (C→M) initiates the reproduction of labour-power; the exchange of wages for commodities (M→C) completes it. At the same time, but at the opposite pole of the class relation, the capitalist's purchase of labour-power (M→C) is the exchange that initiates the valorization process, while the sale of the commodities embodying the surplus-value extracted from labour-power (C→M') is the exchange that completes it. Both reproductive cycles (of labour-power and capital) are mediated by exchange. Yet exchange cannot be realized without the intervention of valueless activity, which capital requires to activate value, i.e., to convert the magnitude of actual value embodied in fixed and constant capital into a potential surplus.

Conclusion

Reification is the fetishization of social relations: the transposition of relations between producers into relations between products. But Marx's critique of reification is epistemological not ontological. The distinction between 'living' (objectivating) and 'dead' (objectified) labour is not a metaphysical contrast between authentic and inauthentic existence or

28 This diagram is taken from Endnotes 2008. I would like to thank Endnotes for letting me use it.

between lived and represented experience. It is a formal contrast between unconscious (unvalidated) practice and conscious (socially validated) activity. Nevertheless, the contrast has an ontological premise: the actuality of exchange depends upon an act that is not actually exchanged (valorized). This unconscious practice is essentially or veridically human precisely in the sense that, under capitalism, our socially validated humanity (as persons) is necessarily dissociative. The question is whether knowing this, and the necessary worthlessness of continuing to reproduce ourselves under the capital relation, provides any clue about determining the negation of this contradiction between what we do and what we are.

Bibliography:

Endnotes 2008, 'Afterword' in *Endnotes 1: Preliminary Materials for a Balance Sheet of the 20th Century*, https://endnotes.org.uk/issues/1/en/endnotes-afterword.

Endnotes 2010, 'The Moving Contradiction' in *Endnotes 2: Misery and the Value-Form*, https://endnotes.org.uk/issues/2/en/endnotes-the-moving-contradiction.

Feuerbach, Ludwig 2012, *The Fiery Brook: Selected Writings*, trans. Zawar Hanfi, London and New York: Verso.

Heinrich, Michael 2012, *An Introduction to the Three Volumes of Karl Marx's* Capital, trans. Alexander Locascio, New York, NY: Monthly Review Press.

Lukács, Georg 1972, 'Reification and the Consciousness of the Proletariat' in *History and Class Consciousness*, trans. Rodney Livingstone, Cambridge, MA and London: MIT Press, pp. 83-222.

Marx, Karl 1998, *The German Ideology*. Amherst, NY: Prometheus Books.

Marx, Karl 2000, *Selected Writings*, David McLellan (ed.), 2nd edition. Oxford: Oxford University Press.

_____ 2000a, *Grundrisse* in Marx 2000, pp. 379-423.

_____ 2000b, *Capital: Volume I* in Marx 2000, pp. 452-525.

Smith, Tony 2009, 'Hegel, Marx, and the Comprehension of Capitalism' in *Marx's Capital and Hegel's Logic: A Re-examination*, Fred Moseley and Tony Smith (eds.) Chicago, IL: Haymarket Books.

Sohn-Rethel, Alfred 1978, *Intellectual and Manual Labour: A Critique of Epistemology*, trans. Martin Sohn-Rethel, London and Basingstoke: The Macmillan Press.

Sutherland, Keston 2010, 'Marx in Jargon', http://www.worldpicturejournal.com/WP_1.1/KSutherland.pdf

Thomas, Peter 2010, 'Labour-Power (*Arbeitskraft*)' in *Krisis: Journal of Contemporary Philosophy*, 2010, Issue 2, http://krisis.eu/wp-content/uploads/2017/04/krisis-2010-2-09-thomas.pdf?

As Fire Burns: Philosophy, Slavery, Technology

Justin Clemens

Abstract: There is an ancient, if rarely thematized bond between philosophy and slavery. As Alain Badiou has recently remarked, 'this [rarety] is especially because from the outset everything is in some sense divided.' For the figure of the slave divides philosophy at its inception, cutting across the divisions of the polis, freedom, and justice. My thesis is that this paradox of the slave is at once foundational and aporetic for philosophy: when the slave appears within the text of philosophy, it thereafter has certain disorganising, if revelatory effects. Moreover, the paradox of the slave is linked integrally to another ancient phenomenon: judicial torture as the model of the extraction of knowledge from a resistant or un-knowing body. This essay examines this situation, in which slavery, torture, and philosophy are variously linked, through a series of vignettes drawn from Spinoza, Plato, Aristotle, and Hegel.

Keywords: Spinoza, Plato, Aristotle, Hegel, Slavery, Torture

> 'If the juridical practice of torture was abandoned precisely when our society began promulgating Human Rights, which were ideologically founded in the abstraction of man's natural being, it was not because of an improvement in mores.' — Jacques Lacan

In Letter 17, dated 20 July 1664, responding to a missive from 'the very learned and prudent Pieter Balling,' in which that eponymous gentleman had written regarding the possible premonitions of impending mortality he perhaps should have had regarding the sighs of his now-dead son, Benedict Spinoza offers a staggering image of his own. Spinoza writes:

> I can confirm, and at the same time explain, what I say here by an incident that happened to me last winter in Rijnsburg. One morning, as the sky was already growing light, I woke from a very deep dream to find that the images which had come to me in my dream remained before my eyes as vividly as if the things had been true — especially [the image] of a certain black, scabby Brazilian whom I had never seen before. For the most part this image disappeared when, to divert myself with something else, I fixed my eyes on a book or some other object. But as soon as I turned my eyes back away from such an object without fixing my eyes attentively on anything, the same image of the same Black man appeared to me with the same vividness, alternately, until it gradually disappeared from my visual field.[1]

1 Spinoza 1985, p. 353. I would like to thank Joe Hughes for alerting me to this letter, and for

Perhaps one might discern overtones of Descartes' Daughter in the pious Flemish Mennonite Balling's question. There is, after all, a notorious story that the philosopher, being so distraught by the death of Francine from scarlet fever at the age of five, built a automatic effigy of his own child in order to continue to have her as if she were still alive.[2] If the first recorded instance of this infamous tale in 1699 significantly postdates Balling's communication, the Cartesian distinction between mind and body is nonetheless clearly at stake in his question, as well as the problems of signs, thought and causality. Balling's question directly concerns the status of the links in experience between imagery, omens and causation: could or should we understand the sighs he heard his son utter as indeed signs of the boy's imminent demise?

For Spinoza, no. 'As for the omens you mention,' he writes, 'that when your child was still healthy and well, you heard sighs like those he made when he was ill and shortly afterwards passed away — I should think that this was not a true sigh, but only your imagination.'[3] One can easily give an interpretation of this letter along the following lines: Spinoza is pointing out that the circumstances under which an image arises say nothing in themselves regarding the truth of that image; that even radically strange and intense images that seem to move between different scales of experience are neither validated nor falsified by such a movement; that the associations of experience in memory have a bearing upon expectations that are, as per the previous remarks, not necessarily veridical nor reliable; and that whatever causation one retrospectively applies to such an image on the basis of subsequent experience must remain speculative.

Yet, despite these delimitations, Spinoza is also returning a certain set of rights to the imagination. As Genevieve Lloyd and Moira Gatens comment, stressing the import of 'emotion' and 'community' in the operations of the imagination:

> Imagination and intellect are here presented as involving two separate orders of thought. But whereas the intellect links together 'demonstrations,' what the imagination links together is 'images and words.' Omens depend on this distinctive associative power of imagination.... Omens, in other words, are not physical events causally connected with other later events.... Spinoza retains also an element of causality in his analysis of omens; but it is relocated to the mind's relations with the body, rather than the relations between physical events.[4]

Yet the peculiarities of Spinoza's own image are evidently not exhausted by his own apotropaic ratiocinations: after all, 'a certain black, scabby Brazilian' is an astonishing vision and an astonishing syntagm. From where would such an image arise? Would it have any possible sense beyond the vicissitudes of an individual's imagination? Is it possible to discern in this image a recurrently disavowed element of philosophy itself, not least regarding the vagaries of corporeal bodies according to the modalities of sickness, slavery, sadness....and, even, *science*?

Perhaps Spinoza would have encountered such figures on the docks in the great trading port of Amsterdam; if so, it would almost inevitably have been as slaves and servants. Moreover, the Spinozan family business — which Spinoza himself later abjured — 'must have consisted, at least in part, in the importing of fruit and nuts from Portugal.'[5] Portugese colonialism was by then fully exploiting African slaves in its plantations in Brazil (and of course elsewhere too), and the Portugese ships would have carried slave cargos. Since Portugal also strenuously controlled trade with Brazil, the ships that came out of Portugal relied heavily on slave labour, and Portugal was a supplier of slaves to other nations, notably Spain. As for the Dutch themselves, they too were ruthlessly engaged in this, the 'oldest trade.'[6] As Angela Sutton reminds us: 'The Portugese had been the main trading presence on West Africa's Gold Coast for over a century, establishing precedents for European-African trade. By the early 1600s, companies such as the Dutch West India Company (WIC) challenged this monopoly and targeted Portugese holdings.'[7] The scabby black Brazilian, in other words, is a figure that, among other things, not only indicates the booty of a ongoing European capitalist trade war, but is a trace of that unpaid labour that sustains that war economy as such.

As for the scabs, there is presumably something unutterably and verisimilitudinously representative about a scab-wracked slave. And would it be possible for anyone familiar with psychoanalysis to ignore the relation to the real — whether of familial or colonial repression — that such scabbiness might designate, for example as manifested in the

his decisive remarks regarding the issues I discuss here.

2 For a recent account of the genesis and implications of this tale, see Kang 2017.

3 Spinoza 1985, p. 352.

4 Gatens and Lloyd 1999, pp. 20-21.

5 Nadler 2001, p. 29.

6 See Vink 2009.

7 Sutton 2015, p. 445.

'Dream of Irma's Injection,' in which Freud recounts, looking into Irma's mouth in his dream, that he saw 'extensive whitish grey scabs upon some remarkable curly structures which were evidently modelled on the turbinal bones of the nose'?[8] We could, in other words, underline in this image a classic return of the repressed: Spinoza's own renunciation of his family, their history, their business, and their religion comes back unheralded in this inexpungible, shocking and affective vision, that, moreover, is invoked by the philosopher only in order to immediately banish it again from any proper philosophical significance. Is it that a disavowed image of a slave functions for Spinoza — perhaps even for philosophy more generally — as an intense exemplum of that sensorial or imaginative intensity which, *because* of its very intensity, must be dispelled if a proper understanding of nature and its causes are to be achieved?

But I am not seeking here to psychoanalyse Spinoza or resituate his thought according to his position in the high era of mercantile European imperialist colonialism, even if we are perhaps today at a point where the chains of life, labour, law and language can finally be given their full and complex articulation as a consequence of the full globalization of what Mark Kelly has recently called 'biopolitical imperialism.'[9]

To put this another way, once there has been a real short-circuit of the opposition between *techne* and *physis*, it becomes possible to discern previously-indiscernible operations regarding the production of non-contradictory paradoxical differences within each of the aforementioned phenomena: life can be seen to be the outcome of an operation between its own self-division as *zoe* and *bios*; labour shows itself as at once material and immaterial; law appears a fold of the bifurcation between sacrifice and sacrality; language presents as a binding rift between signifier and signified. Finally, power itself — as a kind of ur-phenomenon that is produced by, infiltrates, and alters the relations of these four Ls — breaks into the intrications of an affirmative and negative deployment, between its sutures of normalization and its resources of potentiality. Very abstractly, the current era would be a kind of revelation of the inter-essential essence of the ir-reversible historical dehiscence of these phenomena.

Perhaps the recent work of such Italian thinkers as Antonio Negri, Paolo Virno, Roberto Esposito, Giorgio Agamben, and many others, most directly attends to the genesis and implications of these developments.[10] To use a term of Virno's, we are confronted by the patency of the becoming-generic of man, insofar as our times constitute a kind of simultaneous revelation and expropriation of the conditions of human individuation by the realization of the operativity of the generic as such. It is at such a point that, as Jacques Lacan would never forget not to omit, a new Master remerges with a vengeance — even among the most equitable, peaceful, and just among us. And, of course, there is no Master without slaves or servants.

In other words, I am invoking this Spinozan anecdote as a kind of indicative entrée to a number of features of the fundamental problematic of slavery vis-à-vis philosophy. This is indeed an ancient, if rarely thematized bond. As Alain Badiou has recently remarked, 'this [rarety] is especially because from the outset everything is in some sense divided.'[11] For the figure of the slave divides philosophy at its inception, necessarily running through every question of the organization of the polis, thought, freedom, and justice.[12] In fact, my thesis is that the paradox of the slave is at once foundational and aporetic for philosophy. When the slave appears within the text of philosophy, it will therefore 'necessarily' throw the organisation of that text into a certain disarray.

Such divisions run, moreover, not only *between* but *within* each philosopher and philosophy. Examples can be found at the heart of the work of the great founders of philosophy themselves. As Badiou briefly notes, Plato, on the one hand, returns reason to the slave, while never contesting the fact and act of slavery; on the other, Aristotle speaks of the slave as an 'animate tool,' and has almost-universally been held to be justifying the institutions of enslavement as such. If philosophy must constitutively examine the getting of wisdom, then the slave primordially manifests as either already rational (in which case, the institution of slavery does not bear essentially upon the problem of thought and can therefore be set aside) or essentially irrational or sub-rational (in which case, the institution of slavery can receive a certain kind of 'rational' justification). Put otherwise: philosophy doesn't seem to know whether it knows whether a slave knows. And, given it doesn't know if it doesn't know, philosophy then has recourse to certain supplementary operations which aim to rectify this non-knowing. If this is indeed the case, then tracing the peculiar destiny of the image or figure of the slave in

8 Freud 1953, p. 107.

9 Kelly 2015.

10 See, inter alia, Agamben 2015, Esposito 2010, Hardt and Negri 2001, Virno 2009.

11 Badiou 2017, p. 35; see also Timofeeva in the same issue.

12 On this point, see the groundbreaking work of Orlando Patterson, e.g,, Patterson 1982, Patterson 1991, Patterson 2008.

philosophical thought becomes of paramount interest.

The situation is, of course, even more complex and intractable than Badiou's establishing vignette perhaps conveys. For if Plato in the *Meno* does indeed construct a theory of recollection from Socrates' interactions with the slave boy, it is not certain that this state of affairs speaks particularly well of philosophy: as Jacques Lacan points out in *Seminar XVII*, this operation could well be considered the primary philosophical operation par excellence, the *savoir-faire* of the slave being expropriated and abstracted as *savoir* for the master's benefit; rather than an assignation of reason *to* the slave, the operation is instead an attempt to extract reason *from* the slave.[13] That said, it is also possible that Plato deliberately excludes slavery from the *Republic*. As Brian Calvert has argued, Plato never affirms the necessity of slavery, but, to the contrary, asserts that the ideal city's population is to be completed by wage-earners. This implies, first, that there no longer seems to be any labour left to be done by slaves; second, it denies 'that deficiency in intellect is sufficient justification for enslavement'; third, the very structure of the city precludes slavery: there is no class able to own slaves in the republic.[14] The guardians are forbidden private property, which of course includes slaves; the tripartite division of the soul cannot consistently accept that anybody has a 'naturally slavish' soul; there is no public office that deals with slavery.[15] The commentary itself hence remains undecided: did Plato think or refuse to think slavery? Did Plato affirm or deny the very idea of slavery? Was Plato himself on the side of the slave or the master?

Moreover, if Aristotle has often been interpreted as justifying slavery in the most obsequious of terms, Victor Goldschmidt has shown how Aristotle's position on slavery in fact proceeds by a series of uncharacteristic reversals and equivocations, which not only derange the latter's 'habitual method' of enquiry but, taken to the letter of his text, can even seem to deny any legitimacy and justification to the practice.

As Goldschmidt essays to demonstrate: when confronted by a physical phenomenon, Aristotle usually asks as to its existence, and, that established, then asks what it is. Here, by contrast, he presumes the existence of what is precisely in question. Rather than dialectics preceding a scientific inquiry, in this case, Aristotle's scientific beginning into the nature of slavery is *followed* by a dialectic. This inversion or reversal of Aristotle's standard practice has several paradoxical upshots.

13 See Lacan 2007.

14 Calvert 1987, p. 368.

15 See also Dubois 2003.

The examination of slavery is in fact submitted to two movements. The first movement depends on the concepts of property and instrument, that is animate and inanimate nature (*physis*) and what Goldschmidt translates as 'function' (*dynamis*). Aristotle asserts that, as nature, a slave is the property of another, and, as property, his function is to be the latter's instrument. The second movement thereafter takes up the question as to whether or not such a being exists in nature, and, as such, whether this would be a just relation. Goldschmidt points out that the incontestable instutional reality of slavery in Greece doesn't properly bear on the *physics* or nature of slavery: in this particular context, one no longer really knows what such a 'nature' would be. For if nature works by finality, it doesn't always manage to impose its ends, for example, in regards to exceptions or abnormalities.

Furthermore, the doxography on this question — which Aristotle is covertly polemicizing against — harbours three positions. These are: slavery conforms to nature; slavery is contrary to nature; slavery conforms to *nomos* or convention. Yet in themselves, none of these positions is acceptable for Aristotle; together, moreover, they seem to be contradictory. But Goldschmidt wishes to show something else: that Aristotle wants to find a secret complicity amongst these three irreducible propositions, of which they themselves are unaware and unable to discern, and also to demonstrate that all confirm his own position.

Certainly, each position is dissatisfactory in its received form. The proposition that slavery is in conformity to nature really derives from a kind of presupposition of the law of the strongest à la Callicles, but nature doesn't simply function like this for Aristotle. On the other hand, the proposition that slavery is in conformity with convention doesn't do any better, its partisans also relying on a covert presumption regarding the status of the natural. Rather, for Goldschmidt, Aristotle aims to use the figure of the slave to exceed the very division between *nomos* and *physis*, such that '*nature*...is no longer opposed (nor defined in relation) to law or convention: it is referred to its own impotence to always realize what it proposes.'[16] This has several paradoxical upshots, including that those very alleged 'slaves by nature' should, if they in fact truly exist at all for Aristotle, be precisely brought out of their natural servitude by the supplement of art.[17] Rather than a defense of slavery, then, Aristotle rather offers a suprising and rigorous attack upon it.

Goldschmidt's astonishing intervention notwithstanding, the

16 Goldschmidt, p. 159.

17 Goldschmidt 1973.

questions regarding the slave in Aristotle don't end there. Indeed, the title of the present essay — 'As Fire Burns' — appears at least twice in Aristotle. The first instance comes in the *Nichomachean Ethics*: 'Some people think all rules of justice are merely conventional, because whereas a law of nature is immutable and has the same validity everywhere, as fire burns both here and in Persia, rules of justice are seen to vary' (1134b).[18] The second is from the *Metaphysics*: 'manual workers are like certain lifeless things which indeed act, but act without knowing what they do, as fire burns — while lifeless things perform their functions by a natural tendency, the workers perform them through habit' (981b).[19] In this second instance, the 'artisans,' 'manual workers' (*χειροτέχνας*) are compared unfavorably to 'master craftsmen' (*άρχιτέκτων*), according to an order that proceeds from natural objects through craftsmen/manual workers to architects. The manual workers labour through habit, but, unlike the architects, don't know the *arché*, the principles and foundations, of their work; as such, they are also unable to *teach, to transmit,* what it is they do.

Oliver Feltham, who first alerted me to this phrase 'as fire burns' in his discussion of 'functional work' in Aristotle, also notes that this intransmissibility of workers' habits in Aristotle means that their praxis cannot contain its order in itself but must be directed from the outside — at the very moment that their labour as such evaporates into nothingness.[20] One presumes that this may be one reason why Aristotle asserts that some men are slaves by nature, their lack of knowledge regarding their habits, and the origins, principles and ends of such habits, forces them to be dependent for their own good, subject to nature and to those who know. As Reiner Schürmann has noted: 'teleocratic representations refer to the substantial changes artisan man is capable of effecting. From there Aristotle extends them to all philosophical disciplines.'[21] Moreover, as Aristotle puts it in the *Nicomachean Ethics*, 'justice between master and slave and between father and child is not the same as political justice.... for there is no such thing as injustice, in an absolute sense, towards what is one's own.'[22] To be a slave is to be excluded from the possibility of suffering injustice.

Just as Giorgio Agamben has argued, of the three relations that constitute the oikos or domestic realm: the master/slave (*despotes*/

18 Aristotle 1934.

19 Aristotle 1933.

20 See Feltham 2000.

21 Schürmann 1987, p. 83.

22 Aristotle 1934.

doulos), the husband/wife (*gamikè*), and the parental (*technopoietikè*), the first is by far the most illuminating and important. In Agamben's words: 'The slave plays in modern terms more the part of the machinery or fixed capital than of the worker. But... it is a matter of a special machine, which is not directed to production but only use.'[23] This claim — that the slave is tied for the ancients not to production but to use — can find a confirmation in Lacan's remarks in Seminar II that 'people who had slaves didn't realise that one could establish equations for the price of their food and what they did in their *latifundia*. There are no examples of energy calculations in the use of slaves. There is not the hint of an equation as to their output. Cato never did it. It took machines for us to realise they had to be fed. But why? Because they tend to wear out. Slaves do as well, but one doesn't think about it, one thinks that it is natural for them to get old and croak.'[24] A slave is, as such, an in-separable animate organ of the master, whose exclusion from politics founds the economy, whose body is available for any deployment without questioning, and who produces without really producing.

It is for such reasons that Agamben asserts in the course of his discussion of Aristotle the following five propositions regarding the relation of master and slave in regards to 'the use of the body':

1. It is a matter of an unproductive activity (*argos*, 'inoperative,' 'without work' in the terminology of the *Nichomachean Ethics*), comparable to the use of a bed or a garment.
2. The use of the body defines a zone of indifference between one's own body and the body of another. The master, in using the body of the slave, uses his own body, and the slave, in using his own body, is used by the master.
3. The body of the slave is situated in a zone of indifference between the artificial instrument and the living body (it is an *empsychon organon*, an animate organ) and, therefore, between *physis* and *nomos*.
4. The use of the body is, in Aristotelian terms, neither *poiesis* nor *praxis*, neither a production nor a praxis, but neither is it assimilable to the labour of moderns.
5. The slave, who is defined by means of this 'use of the body,' is the human being without work who renders possible the realization of the work of the human being, that living being who, though being human, is excluded — and through this exclusion,

23 Agamben 2015, p. 11.

24 Lacan 1988, p. 75.

included — in humanity, so that human beings can have a human life, which is to say a political life.[25]

So the slave enables: a use that is not labour; an economy which is not political; a vital community that is almost even sub-vegetative; a servitude that is natural and yet permanently open to refiguration.... If the slave is, as Giuseppe Cambiano underlines, reduced to *soma*, to *body* as such, the slave is nonetheless not simply an animal, nor even a plant — as everyone also understands, even as they disavow the fact.[26] Why? Because the problem is that no slave, however degraded, can be considered simply *without voice*. Certainly, the commands given to a slave are necessarily 'functional' — whether they are polite requests, barked orders, silent gestures, or the blows of a whip — which may be perhaps presented as ultimately non-political or pre-political, insofar as they evade any sense of discussion, negotiation, decision, action. But they are not simply natural gestures, either, being signs. As signs, they threaten always to re-enter the realms of the political from which they must be thoroughly excluded.

And it is at this point that the problematic of torture re-emerges as integrally bound up with the metaphysical difficulties with slavery. As Nicholas Heron remarks:

> In classical Athens, the speech of a slave could be admitted publicly (which is to say, as testimony in the context of a trial) only if forcefully extorted under conditions of torture. Indeed, as the ancient sources clearly attest, the vocabulary of Athenian law even reserved a particular term for this specific kind of 'evidentiary' torture: *basanos*. Confronted with with references to this 'barbaric' practice, the historians of ancient Greece have typically reacted either with incredulity or silence. And yet, however cruel and ultimately unjustified it may have been, the motivation behind it nonetheless remains perspicuous.[27]

25 Agamben, 2015, pp. 22-23.

26 'Perhaps we no longer catch the weight that reference to the body had in classical Greece in defining the condition of slavery. In the Hellenistic Age, but sometimes as early as the fourth century BC, the word "body" (*soma*) without any adjective was used to indicate the slave. This was meant to emphasize that a slave was exclusively or mainly a body, rather than a body of a particular kind,' Cambiano 1987, p. 35.

27 Heron 2018, n. 80, pp. 177-178. For a relatively recent historico-legal examination of the phenomenon, see Gagarin 1996.

Heron proceeds to list three justifications for the practice of *basanos*. The first is Moses Finley's: the torture is to degrade the slave in order to distinguish humans who are property from humans who are not.[28] The second is Paige Dubois's: the torture is to mark the difference between free and unfree.[29] The third is Heron's own: the torture is not just a performance of the difference between slave and master, free and unfree, but of the original political division between *oikos* and *polis*. To which, drawing on my own previous work on the subject, I will add a fourth point: torture draws a distinction between voice (*logos*?) and noise, between sense and senselessness, as it paradoxically enables precisely the transformation of noise into voice.[30] For a slave to have a voice bearing on public matters, he or she must therefore be tortured in order that the living noises she emits can signify politically.

The word *basanos* is itself highly significant in the context. As Page Dubois states: 'The ancient Greek word for torture is *basanos*. It means first of all the touchstone used to test gold for purity; the Greeks extended its meaning to denote a test or trial to determine whether something or someone is genuine. It then comes to mean also inquiry by torture, "the question," torture.'[31] (Let us note in passing the real and imaginative associations between mining, mostly done in antiquity by slaves, the use of fire, crucial in mineral extraction, and the necessity for assaying the value of the extract though a touchstone of some kind: we have here all the elements of a liminal but fundamental conceptual figure.) If Dubois herself emphasizes the relationship between torture and truth in a Foucauldian vein, I think that the emphasis could be differently placed. After all, many ancient commentators note the practice but also simultaneously the inexpungible unreliability of such a practice as a tool of truth: Aristotle himself asserts in the *Rhetoric* that there is an irresolvable differend regarding torture's powers to assure veracity. Truth in any fundamental sense is not really at stake in torture — unless we understand it as bearing upon the truth of the specific division of the polis itself.

It is for this reason that the emergence of actually-existing democracies of one kind or another has been so crucial to philosophy in many of its greatest moments. This is so not because philosophers are democrats — quite to the contrary. It is rather because democracy

28 See Finley 1980.

29 See Dubois 1991.

30 See Clemens 2013; on the problematic of 'voice' in philosophy, see also Agamben 1991 and Dolar 2006.

31 Dubois 1991, p. 7.

constitutionally bans torture for its citizens. No other kind of polity makes this ban constitutive, but it is only on the basis of such a ban that something that has proven essential to philosophy can emerge: the problematic of speech-as-action as such, a speech that bears on its own conditions of taking-place, as well as upon other such acts. Why? Because 'free speech' in a democracy has never until recently meant 'say anything'; it instead signifies that a citizen or 'free man' has *the right to speak or not to speak*, that is, that that freedom is the freedom of action inscribed in the deployment of a voice, which remains free only insofar as it is not coerced, that is, not extracted through torture.[32]

But if democracy enables such a structure to appear — that to have a voice is to not to have to use it — it also vitiates or undermines its own possibilities by a variety of means, of which the sophists are the emblem for Plato. But it also vitiates its own possibilities by precisely retaining within its ban on torture an unjustified — and potentially unjustifiable — exception, which can be phrased as the paradox of the slave I broached above. Only man has politics and language, that is, a voice, a voice that is by nature free; but some men can only have a voice by not having it, precisely insofar as they are slaves, and can only acquire such a voice when it is extracted under duress, that is, when it is subjected to the very routines which must be otherwise banned in order to ensure the conservation of political existence. Insofar as this is the case, the voice of the tortured slave is not the slave's voice at all, but the voice of the polis itself, which pulls *logos* out of *physis* by *basanos*.

But it is then in the figure of the slave that 'the question concerning technology' as elaborated by philosophy perhaps finds one unheralded commencement. It is not simply that the slave is an ancient figure of automation or of political technics or some such, although there are certainly zones of indistinction evident in this regard. It is rather that the use of torture — as forced extraction of voice from a living body that must otherwise not have a voice, and which thereby contravenes the usual conditions under which voice should be available at all — comes to function as one fundamental model for the operations of technology or technics as such.

I believe this paradox of the slave-torture nexus as integrated with the thinking of technology can be shown to be operative at key moments in the texts of philosophy. If there is evidently no end to such a list, one of the most famous of these apparitions is undoubtedly in

32 Insofar as this is the case, Foucault's late researches into the varieties of ancient forms of 'free speech' (perhaps most notoriously his account of *parrhesia*) are somewhat vitiated insofar as they are stripped of any relation to torture, perhaps a minor conundrum given the thinker's otherwise infamous attentiveness to the powers of torture, e.g., Foucault 1996.

Hegel. If the notoriously tricky dialectic of 'master and slave' to be found in the *Phenomenology of Spirit* may seem — as it has at least done to some of its most influential interpreters — to give the slave a crucial destiny in the philosophical anthropology, it remains the case that the specificities of the dialectical argumentation are themselves marked by serious difficulties. Badiou gives three: first, if Alexandre Kojève famously translates it as '*esclave'* in *Introduction à le lecture de Hegel*,[33] the word that the *Phenomenology* actually uses for this character is '*Knecht*,' bondservant (which strictly speaking denotes a feudal servant, and, significantly, derives its legitimacy for Hegel and the German language more generally from Luther's translation of Saint Paul's *doulos*, slave, as *Knecht*); second, that Hegel ignores the fact that a certain technological hierarchy must already really *precede* the encounter that allegedly founds that hierarchy (e.g., guns and ships); third, Hegel renders inaccessible the political subjectivity of the slave as such. In sum — and one must assent to Badiou's judgement here — Hegel's thinking 'certainly does not really touch the real of slavery.'[34] For Badiou, by contrast, such a thought would have to attend to 'the real political subjectivity of the slave,' as he himself has attempted in regards to Spartacus in *Logics of Worlds*, or others have done, say, with respect to the Haitian Revolution and its consequences.[35]

My examination here has taken a slightly different tack, insofar as it has sought only to indicate the possibility of the surprising presence of a shadowy image of slavery in philosophy, and the further linking of this image to a problematic of torture. In the picture I have sketched, torture moreover comes to function as a kind of disavowed matrix for the philosophical thinking of technology insofar as it transforms noise to voice, sound to sense, and paradigmatically in a *political* frame, even as the political aspects of this framing tend to dissipate into express physical or metaphysical concerns. In other words, the question concerning the essence of technology as thought by philosophy has an integral bond with such a divided figure of slavery. Yet, as such, the possibility of the slave as subject becomes moot at best. From Plato's slaveboy, through Spinoza's 'scabby black Brazilian' and Hegel's *Knecht*, to Nietzsche's theses regarding 'slave morality' and beyond, such figures can only manifest....as fire burns.

33 See Kojève 1947.

34 Badiou 2017, p. 45. See also Vatter 2014 for a very interesting recent interpretation of Hegel's difficulties.

35 See Badiou 2009, esp. pp. 51-54; Wright 2013.

BIBLIOGRAPHY

Agamben, Giorgio, 2015, *The Use of Bodies*, trans. A. Kotsko, Sanford: Stanford University Press.

----------, 1991, *Language and Death: The Place of Negativity*, trans. K.E. Pinkus with M. Hardt, Minneapolis: University of Minnesota Press.

Aristotle, 1933, Metaphysics, trans. H. Tredennick, London: Heinemann. Available online at: http://www.perseus.tufts.edu/hopper/text?doc=Aristot.%20Met.

----------, 1934, *Nichomachean Ethics*, ed. and trans. H. Rackham, London: Heinemann. Available online at: http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0054%3Abekker+page%3D1094a%3Abekker+line%3D1

Badiou, Alain, 2017, 'Hegel's Master and Slave' in *Crisis and Critique*, 4, 1: 34-47.

----------, 2009. *Logics of Worlds*, trans. A. Toscano, London: Continuum.

Calvert, Brian, 1987, 'Slavery in Plato's Republic,' *The Classical Quarterly*, 37, 2: 367-372.

Cambiano, Giuseppe, 1987, 'Aristotle and the Anonymous Opponents of Slavery' in M.I. Finley (ed), *Classical Slavery*, London: Frank Cass.

Clemens, Justin, 2013, *Psychoanalysis is an Antiphilosophy*, Edinburgh: Edinburgh University Press.

Dolar, Mladen, 2006, *A Voice and Nothing More*, Cambridge, Mass.: MIT.

Dubois, Page, 1991, *Torture and Truth*, New York: Routledge.

----------, 2003, *Slaves and Other Objects*, Chicago: University of Chicago Press.

Esposito, Robert, 2010, *Communitas: The Origin and Destiny of Community*, trans. T. Campbell, Stanford: Stanford University Press.

Feltham, Oliver, 2000, *As fire burns: functional work and praxis in ontology*, unpublished PhD thesis, Melbourne: Deakin University.

Finley, Moses, 1980, *Ancient Slavery and Modern Ideology*, London: Chatto and Windus.

Foucault, Michel, 1996, 'Truth and Juridical Forms' in *Social Identities: Journal for the Study of Race, Nation and Culture*, 2, 3: 327-342.

Freud, Sigmund, 1953, *The Interpretation of Dreams* in *The Standard Edition of the Complete Psychological Works of Sigmund Freud, Vol. IV*, trans. J. Strachey et al. London: Hogarth Press.

Gagarin, Michael, 1996, 'The Torture of Slaves in Athenian Law,' *Classical Philology*, 91, 1: 1-18.

Goldschmidt, V. 1973, '*La théorie aristotélicienne de l'esclavage et sa méthode'* in *Zetesis*, Antwerp: De Nederlandsche Boekhandel: 147-163.

Hardt, Michael and Antonio Negri, 2001, *Empire*, Cambridge: Harvard University Press.

Heron, Nicholas, 2018, *Liturgical Power*, Fordham: Fordham University Press.

Kang, Minsoo, 2017, 'The Mechanical Daughter of Rene Descartes: The Origin and History of an Intellectual Fable' in *Modern Intellectual History*, 14, 3: 663-660.

Kelly, Mark, 2015, *Biopolitical Imperialism*, Alresford: Zero Books.

Kojève, Alexandre, 1947, *Introduction à le lecture de Hegel*, Paris: Gallimard.

Lacan, Jacques, 1988, *The Seminar of Jacques Lacan, Book II: The Ego in Freud's Theory and in the Technique of Psychoanalysis 1954-1955*, trans. S. Tomaselli, New York: Norton.

----------, 2006, *Ecrits*, trans. B. Fink with E. Fink and R. Grigg, New York: Norton.

----------, 2007, *The Seminar of Jacques Lacan: The Other Side of Psychoanalysis*, trans. R. Grigg, New York: Norton.

Nadler, Steven, 2001, *Spinoza: A Life*, Cambridge: Cambridge University Press.

Spinoza, Benedict, 1985, *The Collected Works of Spinoza*, ed. and trans. E. Curley, Princeton: Princeton University Press.

Patterson, Orlando, 1982, Slavery and Social Death, Harvard University Press.

----------. 1991, Freedom in the Making of Western Culture, New York: Basic Books.

----------, 2008, 'Freedom, Slavery and the Modern Construction of Rights' in H. Joas and K. Wiegandt (eds.), The Cultural Values of Europe, Liverpool: Liverpool University Press.

Schürmann, Reiner, 1987, *Heidegger on Being and Acting: From Principles to Anarchy*, trans. C.-M. Gros with the author, Bloomington: Indiana University Press.

Sutton, Angela, 2015, 'The Seventeenth-century Slave Trade in the Documents of the English, Dutch, Swedish and Prussian Royal Slave Trading Companies' in *Slavery and Abolition*, Vol. 36, Issue 3, pp. 445-459.

Timofeeva, Oxana. 2017, 'Freedom is Slavery' in *Crisis and Critique*, 4, 1: 425-476.

Vatter, Miguel, 2014, *The Republic of the Living: Biopolitics and the Critique of Civil Society*. Fordham: Fordham University Press.

Vink, M.P.M., 2009, 'Freedom and Slavery: The Dutch Republic, the VOC World, and the Debate over the "World's Oldest Trade"' in *South African History Journal*, 59: 19-46.

Virno, Paolo, 2009, "Natural-Historical Diagrams: The 'New Global' Movement and the Biological Invariant" in L. Chiesa and A. Toscano, Eds. *The Italian Difference: Between Nihilism and Biopolitics*, Melbourne: re-press.

Wright, Colin, 2013, *Badiou in Jamaica: The Politics of Conflict*, Melbourne: re-press.

C R I S I S & C R I T I Q U E / Volume 5 / Issue 1

Science without Philosophy: The Case of Big Data

Jean-Pierre Dupuy

Abstract: The article investigates the connection between the possibilities and dangers emerging with Big Data and the domain of ethics, that is of action. The true question arising here is if there are any ethical points of orientation an action could rely on that would be able to stand up against the challenges of big date. The article problematizes traditional ethical accounts (Sartre's) by turning to an ancient paradox and its newest guises (among them Minority Report and its real-world equivalent): the paradox that lies in how a prediction of the future prevents this very future from taking place. But there will nonetheless be another, a counterfactual future. How to ethically and politically deal with it?

Keywords: causation, common sense morality, correlation, counterfactuals, PredPol, prophecy of doom

Just as with any new scientific or technical paradigm, Big Data lends itself well to ideological offshoots [*dérives*], which, if we are not careful, could compromise Big Data's indisputable contribution to both knowledge and action - as the other articles in this collection amply illustrate.
The convergence of nanotechnology, biotechnology, information technology and the cognitive sciences (NBIC convergence) has given birth to a transhumanist ideology that asserts the need for the fastest possible passage to the next stage of biological evolution; where conscious machines will simply replace us. Meanwhile, the ideology that accompanies Big Data heralds the beginning of new scientific practices that force theoretical concerns into the background, thereby jeopardising the progress of knowledge and, worse still, from our perspective as ethicists, undermines the very foundations of an ethic that wishes to be rational. This double threat will be examined here.

1. Modelling, causality and correlation

The idea that data processing could become the foundation of a new science has slowly begun to materialise. Provided that the available data is sufficiently rich and abundant and that the algorithms exist to identify regularities from the inextricable clutter that constitutes all this data - for example in the form of correlations. This idea has proliferated since the sheer amount and variety of information has increased, but so too has the dazzling progress of computer programming.[1] This idea has quite

1 We should remember that computer science was born, in part, from the genius of John von Neumann. Von Neumann was confronted with the impossible task of trying to resolve a system of equations to formalise the explosive dynamics of the hydrogen bomb. See below.

literally been displayed recently, and without hesitation, its proponents have proclaimed: "the end of theory." In June 2008, Chris Anderson, the Editor-in-Chief of that magazine "wired" to Silicone Valley, Wired Magazine, entitled one of his articles: "*The End of Theory: The Data Deluge Makes the Scientific Method Obsolete*." The article stated that henceforth: 'correlation supersedes causation, and science can advance even without coherent models, unified theories, or really any mechanistic explanation at all.'

In the eyes of historians and philosophers of science, such affirmative statements are both pathetic and lamentable. It's as though Emile Meyerson,[2] Karl Popper,[3] and Thomas Kuhn[4]'s epistemological theories had never existed. As though they never insisted on the impasses of radical empiricism. Never argued about the impossibility of escaping a "metaphysical research programme." Never mentioned the indispensable role of hypotheses proceeding by a process of conjectures and refutations for scientific progress - which can be translated by the formula: "there are no raw facts."[5]

In this paper we will focus on the "causality, correlation, modelling" trio by asserting, or rather, recalling that scientific theorisation is unable to operate without modelling and that banishing the notion of causality to the rung of superstition from the prescientific age is still a long way off. Though, if this were the case, we could understand that Big Data's ideological attack is only an attack on a straw man; boldly proclaiming causality's obsoleteness and calling for its being put to death by employing correlations. The only problem is that theory has already done that job.

On this question, which is as fecund as it is difficult,[6] we will limit ourselves to only two examples. The first well-known example is that of the underlying metaphysics of the theory of general relativity dating from between 1907-1915 and Newton's law of universal gravitation from 1687. As much as the latter preserves causality by proposing that the celestial bodies exert forces of attraction on each other, relativity abandons causality altogether by geometrizing the movement of the stars in space-time in four dimensions. Einstein could argue that Newton's universal

2 Meyerson 1991

3 Popper 2005

4 Kuhn 2012.

5 So we see that the Latin word "datum," coming from the verb "do," meaning that which is given, is perfectly inappropriate. "Fait," from "facere" is the convenient one. All facts are constructed.

6 I deal with this in chapter 1 "The Fascination with Modeling,", in Dupuy 2009.

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attraction, which is not so far removed from Newton's practice of astrology, was still dependent on the belief in the evil eye, i.e., a causality linked to the interpretation of human things. Or put simply, a call upon magic.

The lesser known second example is the complexity paradigm, more precisely what is known as Complex Systems Modeling, which burst onto the scientific scene when the mathematician John von Neumann first defined this concept in 1946 at a conference held at the California Institute of Technology (CalTech), in Pasadena, California. A complex object, he conjectured, is such that the simplest model that can be given is itself. The information it contains is incompressible. It is interesting that von Neumann resorted to an example borrowed from economic theory to illustrate his point.

The text von Neumann chose is Vilfredo Pareto's *Manual of Political Economy (1906)*. In it, Pareto explains that the model of general economic equilibrium, developed with Leon Walras, is a model that formalises the mechanism of the formation of price in a competitive market:

> Not in the least to arrive at a numerical computation of prices. Let us make the most favourable hypotheses, for such computation; let us suppose that all difficulties regarding knowledge of the data of the problem have been overcome, and all the *ophelimites* (*i.e., "utility" or "desirability", J.-P. D*[7]) of every commodity for each individual are known, as well as all the conditions of production of the commodities etc. This is already an absurd hypothesis; and yet it is not enough to give us the practical possibility of solving the problem. We have seen that, in the case of 100 individuals and 700 commodities, there would be 70,699 conditions (in fact, a large number of conditions, so far disregarded, would increase that number still further); we would thus have to solve a system of 70,699 equations. That would practically exceed the power of algebraic analysis, and it would do so still more if one were to consider the incredible number of equations that would be needed for a population of forty million individuals and some thousands of commodities. *In such a case, the roles would be reversed*;[8] it would not be mathematics that would come to the aid of political economy, but political economy to the aid of mathematics. In other words, if all these equations could really be known, the only humanly possible way to solve them would be to observe the

7 Translator's note: Author's addition

8 Translator's note: italics added by the author

practical solution brought about by the market.[9]

In other words, it is only the market itself that can tell us what it is capable of. The best and simplest model for the behaviour of the market is the behaviour of the market itself. The information that the market deploys is at the service of those who let themselves be carried away by its dynamism. This is not "compressible." As a last resort, the market - and by extension all complex systems - is to itself its own cause and its behaviour is not reducible to the game of identifiable causes at a more elementary level.

"Big Data" promises only one thing: it can predict even if we do not understand what it returns. Hence the formula: "with enough data, the numbers speak for themselves."[10] Or even:

> in many instances, we will need to give up our quest to discover the cause of things, in return for accepting correlations. With big data, instead of trying to understand precisely why an engine breaks down or why a drug's side effect disappears, researchers can instead collect and analyse massive quantities of information about such events and everything that is associated with them, looking for patterns that might help predict future occurrences. Big data helps answer what, not why, and often that's good enough... A worldview built on the importance of causation is being challenged by a preponderance of correlations. The possession of knowledge, which once meant an understanding of the past, is coming to mean an ability to predict the future.[11]

Big Data claims to be playing with the *complication* of data. The above statement makes it possible to say that Big Data's stumbling block is the sheer *complexity* of phenomena.[12] If, instead of understanding, predictions are all that Big data has to offer, then in the case of complex systems it *will not understand* why it cannot predict. Big Data will have sacrificed understanding to a non-existent ability to predict.

2. Big Data and the Question of Ethical Foundations

9 Translator's note: Pareto 2014.

10 Anderson 2008

11 Cukier & Mayer-Schoenberger 2013.

12 The distinction between complication and complexity is one of the most important contributions of contemporary epistemology. See Henri Atlan's recently reissued, in Atlan 2006.

Ethics presupposes a human subject that acts. Acting is, etymologically, starting a new process, setting in motion sequences of causes and effects. To think of ourselves as free in a deterministic world, therefore, implies that we must resort to a fiction, but this fiction is necessary for us to give meaning to our actions, to judge them in relation to norms, to evaluate their consequences. According to this fiction, we can act only to the extent in which we are able to start new causal chains, by the effect of our will. To act as if we were free leads us to consider counterfactual[13] propositions of the type: "If I acted otherwise than I have, then such consequences would ensue."

When big data contents itself with renouncing the search for causal links in the domain of natural phenomena, it does not innovate at all, as we have just seen, and what's more, it blinds itself. But when Big Data's misguided creep continues into the domain of the humanities, it compromises the very possibility of ethics itself.

We will illustrate this assertion with a look at a case that plays an important role in the internal controversies of contemporary rationalist moral philosophy. The question is whether, having to evaluate a certain action in terms of rationality and ethics, we must limit ourselves to its causal consequences or if we must also take into account its non-causal consequences. An example will help to understand these notions.

Let us imagine that, thanks to Big Data, we detected a correlation between certain types of behaviour and the incidence of a disease. Roughly speaking, and only to concentrate these ideas, consider the statistical dependence between smoking regularly and lung cancer. Big Data alone does not enable us to go any further or enter the world of causes. Now, three cases are possible if two variables are correlated: the first may be the cause of the second, the latter may be the cause of the second, or both result from the same common cause. In this example, either smoking causes lung cancer - causality is reversed in the opposite direction - or the propensity to smoke and lung cancer is caused by both, independently, by the same risk factor, say a specific gene for instance.

13 A conditional proposition of the type "if, then" can be indicative ["If it rains tomorrow, I will not go to work"] or counterfactual ["If I were richer, I would buy myself a Lamborghini"]. The term "counterfactual" refers to the presence of an antecedent ["If I was richer"] that is contrary to the facts (alas, I am not richer than I am). The behaviour of these two types of conditionals in our reasoning varies dramatically. To take a classic example, the proposition "If Shakespeare did not write Hamlet, someone else did" is undoubtedly true since the play exists and it necessarily has an author. On the other hand, it is highly problematic to attribute the truth value "true" to the counterfactual proposition "If Shakespeare had not written Hamlet, someone else would have done it". One can think that only the genius of the Bard could produce this masterpiece.
Counterfactual propositions are about possible worlds that are "close" to our world, the present world, the only one we have. We cannot do without them, in our thoughts and reasonings, especially when a significant event occurs that might not have happened or, on the contrary, an event does not occur which, if it was produced, would have upset our life or the world, for good or bad.

We should ask, what is good practice? Or what recommendations could we make in each of these two cases? If smoking causes lung cancer, it is evident that we must not smoke. On the other hand, there is no reason to quit in the other case, even if one ignores the presence or absence of the offending gene in a particular individual. It is a principle of rational choice that makes it possible to understand it. Called the Sure Thing principle, so-called by the great American statistician Leonard Savage, who made it an axiom of rational choice theory - an axiom, that is, a proposition that in principle draws evidence from itself, like a tautology. In this case, Logic seems to boil down to common sense. Regardless of the value of a variable hidden from me (in our example, the actuality or not of the gene responsible for lung cancer) the preferred option between the several possibilities offered is always the same (say, I would prefer to smoke rather than to abstain from smoking). It does not matter whether I know the value of the variable. I would simply prefer this option, that's the point, and I choose it without further ado (in this example, I choose to smoke or continue to do so).[14]

In the smoking example, smoking is said to constitute the *dominant strategy*: Smoking is the best option regardless of the unknown state of my health. Clearly, the best course of action essentially depends on the causalities behind the correlations: direct on the one hand, and indirect, through a common cause on the other.

The example we have just considered involves a criterion of judgment, which is rationality. Yet, what about ethics proper?

For many, the ethical gesture *par excellence* consists in asking oneself what would happen if other people acted as I did? In *Existentialism is a Humanism (1946)*, Sartre writes: 'Certainly, many believe that their actions involve no one but themselves, and were we to ask them, "but what if everyone acted that way?" they would shrug their shoulder and reply, "But everyone does *not* act that way." In truth, however, one should always ask oneself, "What would happen if everyone did what I am doing?" The only way to evade that disturbing thought is through some kind of bad faith.'[15] Under the banner of deontology[16] Kant formalised this gesture into an imperative said to be categorical; which could be paraphrased as: "Act always in such a way that you might be able to *will without contradiction*

14 This axiom is said in terms of preferences: if a subject prefers an option p to another q in the case where the state of the world belongs to a subset X; and also prefers p to q in the complement of X; then he must prefer p to q even if he does not know if the state of the world belongs to X or the complement of X.

15 Sartre 2007, p.25

16 Not to be confused with the deontology as a professional ethics.

that the maxim of your action becomes a universal law."[17]

Here's a personal anecdote that illustrates the importance of causality in ethical issues. One summer, I was walking with my then thirteen-year-old daughter in one of Colorado's beautiful canyons. The red sandstones from this region of the world have eroded the fantastic well-known landscapes. We had stopped in the shade of one of these formations, and I had fallen asleep. I woke up with a jolt to the sight of a couple walking towards us, the eyes of the woman betrayed a moral indignation that only a kind of puritanism is capable of arousing. I turn to my daughter and see her engraving her name in the soft rock. I immediately said loudly and in English, so that the threatening couple could overhear: 'Beatrice, stop it!' However, to a girl of thirteen, I do owe an explanation. The only one I could come up with was the most banal: 'Imagine,' I said, 'what would happen if the tens of millions of visitors who come here every year did as you have done? In response to the Dantesque evocation of an immense cliff collapsing under the accumulation of engraved signatures, my daughter's response was quickfire: "But, papa, if the others do like me, it's not my fault! "

Firstly, it should be noted that my daughter's reply flips Sartre's words from the quotation above. Her excuse is not "others do not do as I do," but rather the argument: "supposing that they did do what I did, I'm not the cause; therefore, I am not responsible."

This is common sense morality. It has its strengths and dignities because it is rooted in a phenomenology of action that corresponds to what has been the common experience of humanity throughout its history and until the quite recent past. The common experience was that: 1) actions are more important than omissions; 2) closer effects are much more visible, and therefore more important, than distant effects; 3) individual effects are more important than group effects or compositional effects.

The traits of common sense morality that directly reflect this phenomenology of ordinary action are: 1) Negative duties ("you will not kill") have absolute priority over positive duties ("you will help your neighbour"). We have more responsibility for what we do than for what we let ourselves do. One does not harm an innocent man even if it is the *sine qua non* condition to alleviate the suffering of ten others. 2) There are particular, special, obligations to one's relatives that one does not have in relation to the rest of humanity.

It can be argued that this restrictive conception of normative

17 Kant 1991 ['So act that your maxim could become a universal law'. p.4.] I simplify and complete the original formulation for clarity.

responsibility has become unsuited to our present situation. Positive duties have become as important as negative duties. The distinction between intentional killing by an individual act and killing because one only cares about one's selfish welfare as a citizen of a rich country while the others die of hunger, this distinction is becoming increasingly problematic. We must be concerned about *all* the consequences of our actions and omissions, not just the nearest or the most visible.

Therefore, can we still say that if others do like us, we are not responsible for what they do? There are correlations between our actions, but are these correlations reasons? Many threats to our future result from the synergy of a multitude of tiny individual actions, each of which in isolation has undetectable consequences (think: global warming). The distinction between omission and action loses its meaning: "refrain from [*abstenez-vous de*] using your car for city journeys!" says ordinary language. If we obeyed, would it be an "*abstention*"? It would indeed be an action in the strongest sense of the term; this word has, etymologically speaking, non-causal beginnings, setting in motion something radically new in the network of human relations. Couldn't we extend these considerations to *all* the effects of my action and omissions, including the non-causal counterfactual effects taken into account by Kantian morality: if I abstained from engraving my name on the rock (but I do not do it), then would I inaugurate a virtual world where others would do the same? First, by direct causality: it is obvious that one is less inclined to respect a standard of decency if one is the only one to do it. But also by the pattern of the common cause: the correlations between our actions and those of millions of others often reflect the fact that we are driven by the same factors.

It is legitimate to resist these arguments and to defend, at least by default, common sense morality. Sartre said: 'a man who commits himself, and who realises that he is not only the individual that he chooses to be, but also a legislator choosing at the same time what humanity as a whole should be, cannot help but be aware of his own full and profound responsibility.'[18] We want to reply: it's too much, let's just stay at the level of man.

The focus of my paper is not to take sides on these questions which would demand so many moral and intellectual resources, but simply to say this: if we let them spread, the ideological offshoots [*dérives*] of Big Data will crush and bulldoze all the most fundamental conceptual distinctions that no ethical theory could do without.

18 Sartre 2007.

3. A Case Study: Predictive Policing. Statistics and the Banality of Evil

Le Monde, 12 octobre 2015
Figure 1:
Top Left: "*We'll liquidate the terrorist before they commit an attack*.
Top Right: "*But what's your proof that there's actually a terrorist*?
Bottom: "*Well, the attack hasn't taken place*."

A. A very ancient paradox

The prevention of future crimes leads us to one of the oldest pragmatic paradoxes that humanity has faced ever since it started posing ethical questions. In the age of 'Big Data,'[19] this paradox finds itself incarnated in new institutions.

Without harking back to the Ancients, nor to the Bible, we find a particularly effective version of this paradox in *Zadig*, the philosophical tale that Voltaire concocted to ridicule Leibniz's theodicy. When the eponymous hero spots the hermit, who is accompanying Zadig on his travels, assassinating the nephew of their overnight host, Zadig is alarmed. Revolted by his actions, he questions the hermit: can you find no other reward for the generosity of our benefactress than this dreadful crime? To which the hermit, who is none other than the angel Jesrad, the spokesman for Leibniz's system, answers: if this young man had lived, he would have killed his aunt in a year and then, the year after he would have

19 We should feel free to translate this expression "Big Data" as it is understood, provided, of course, that we do the schooling. It was invented by one of my former students of the X [Big Data], now billionaire, Yann Le Cun. Creator of one of the most brilliant algorithms which deals with huge masses of data, he was recruited by Mark Zuckerberg to develop Advanced Artificial Intelligence within FaceBook. He confessed that it was on a whim, and after not much thought, that he forged the expression "Big Data". It turns out that it has flourished, no doubt by mimetic laziness.

murdered you, Zadig. How do you know? Zadig exclaims, the answer: "it was written." It was written, perhaps, but this will not now happen - the fault of a criminal.

The great American science-fiction writer Philip K. Dick was inspired by this tale, drawing a subtle and complex new one, *Minority Report*.[20] The paradox is the same: the police of the future, relying on the increasingly accurate predictions made by a trio of Fates, (*Precogs)*, neutralise criminals a quarter of a second before they commit their crime - their slogan is: 'it's not the future if you stop it!' Note that the paradox only exists because it is postulated that the future is predictable. In *Minority Report*, not only will a crime come true but it cannot not be realised - in philosophical terms, it is fixed, in the sense that it is counterfactually independent of the actions that precede it. Predictions of the kind found in "*Bison futé"*[21] do not have this claim: they do not say what the future will be but what it would be if the motorists remained indifferent to the prediction made public.

It would be wrong to believe that this paradox is a mere invention of the idle metaphysician or philosopher, and wrong to believe that there's no practical import too. In its Voltairian vein, it stages the question of the compatibility between free will and determinism of theological flavour. This brings us closer to Big Data; one of its many incarnations involves a stochastic determinism; I am thinking of the defence of Adolf Eichmann by the German lawyer Robert Servatius. This is what Hannah Arendt had to say in her *Eichmann in Jerusalem:*[22]

If the defendant excuses himself on the ground that he acted not as a man but as a mere functionary whose functions could just as easily have been carried out by anyone else, it is as if a criminal pointed to the statistics on crime—which set forth that so-and-so many crimes per day are committed in such-and-such a place— and declared that he only did what was statistically expected, that it was mere accident that he did it and not somebody else, since after all somebody had to do it.[23]

A regularly discussed case at the University of Yale's Department of Law elicits a proximate reflection:

A clever genie visited the Prime Minister of a certain country and

20 Steven Spielberg directed a film of the same name, alas he sacrificed the metaphysical dimension of the story for fear of lost profits.

21 Translator's note: Bison futé, literally 'cunning bison', is the name of the French National Road Traffic Organisation. They prepare traffic reports and often 'predict' motoring queues, delays, and release warnings in advance. (www.bison-fute.gouv.fr/).

22 Arendt 1994.

23 Ibid., p. 289

offered him the following deal: "I know your economy is languishing, I am eager to help you restart it, and I can offer you a fabulous technological invention which will double your Gross Domestic Product, as well as the number of jobs available, but there is a price to pay. Every year I will ask for the lives of 20,000 of your fellow citizens, including a large proportion of young people and women." The Prime Minister pulled back with fright and sent the visitor packing. He had just rejected the invention of ... the automobile.

If our societies can accept the evil that is roadside mortality with such ease, if it doesn't pose them any particular problems of conscience; it is precisely because they never represent it in terms of this apologue. The question that this story presents is a classic moral dilemma, it is about knowing if innocent victims can be sacrificed on the altar of the collective good. Although obsessed with this type of case, classical moral philosophy has never been able to enlighten them satisfactorily. As it is enough to naturalise the terms of the moral question to make it disappear entirely. The traffic flows of the automobile are subsumed under the laws of hydrodynamics, and statistical regularities just assume the arrival of fatalities.

B. The Paradox Embodied: Predictive Policing

In Philip K. Dick's short story, the three Fates are called "Precogs" (for "pre-cognition"). Their real-world counterpart is a Californian startup set up in the university city of Santa Cruz and named Predpol (for "Predictive Police"). The idea behind it came from UCLA anthropology professor Jeffrey Brantingham.[24] He intended to set up a "mathematics of crime." Convinced that crime is predictable in the short term, especially concerning the locations of the occurrences of crimes. His model was to be the forecasting of earthquakes. The first shock is very difficult to anticipate, but it is much easier to predict the aftershocks. Similarly - at least in California - if a house is broken into, the probability of it being broken into again in the near future is doubled. 'Whatever the causes,' says our anthropologist, 'the facts are there. The sequence of events is modelable.' Anticipating what a political or moral objection might be, he adds: 'We do not do any profiling, we do not look at the perpetrators. For our predictions, offenders' identities, or their socio-cultural characteristics, are worthless.'

The police department of Modesto, a modestly sized town in the San Joaquim Valley in central California, granary to the world, was one

24 The word "crime" in English has a much wider gamut of meaning than in French. In France, a robbery is not a crime but a délit, though in English it remains a 'crime.'

of the first to pay for Predpol's services and did so with the aim of saving money. And it turned out to be "effective": robberies dropped by more than a quarter while half of the arrests occurred in the priority areas defined by the algorithm. Some older police officers have had a hard time applying these new methods on the grounds that 'we are not predicting the future.' Others simply observe with pleasure as the risk zones, defined and operated by Predpol, begin to disappear from the priority map after a certain time: this is proof that the system has worked. About 100 American cities, including Los Angeles and Atlanta, are using today's Predpol services. France is seriously considering following suit.

There are very few political and ethical analyses on the presuppositions and implications of this practice, both in the Anglo-American world which invented the practice as well as in France. We nevertheless find articles and controversies on the technical dimensions of the problem.

Two young French researchers have echoed this concern. The sociologists Ismaël Benslimane from the Joseph-Fourier University in Grenoble et Bilel Benbouzid of the University of Paris-Est Marne la Vallée. We should say at the outset that this literature is very verbose, pretentious, and often hollow - that is to say quite ideological. Yet, some remarks should draw our attention. What makes it interesting is that, without even perceiving it, the authors stumble on the same paradoxes as those we presented.

At a technical level, the main criticism of the PredPol software is that it just pushes on open doors. Much simpler algorithms and even the experience-based knowledge of the police can do just as well, if not better perhaps. The reason is the very particular nature of the spatial distribution of crimes and offences in the cities of the industrial world. For example, in the case of a city like Chicago, we can say that approximately 80% of crimes are concentrated in around 20% of the city. This very high concentration is the expression of a law of fractal probability, also called Pareto law. This law appears when mimetic phenomena are at stake. As is the case here since, as we have seen, the existence of a crime or offence in a given place increases the chances of recidivism in an interval of time that is not very long.

A thought experiment is useful to understand the mechanisms involved. Imagine a rain of ten thousand chips that fall evenly over an area where there are a hundred bowls ready to receive them. The chips fall independently of each other, the distribution of the number of chips per bowl will obey the bell curve (called Gaussian distribution). Most cups will contain a number of chips that will not be very far from the average, say a hundred chips. There will be a small number of cups that will hold very few chips or on the contrary several hundred. Let us now change the

conditions of the experiment by postulating a given cup that will have more chances of attracting the falling tokens, while already containing a large number. The distribution of chips on all the cups then acquires an entirely different physiognomy. A self-reinforcing mechanism amplifies deviations from the mean of the bell curve. Extreme events gain a considerably increased probability. The distribution thus obtained is said to be fractal because it retains the same physiognomy regardless of the threshold at which it is cut, that is to say, the minimum number of tokens below which it is decided not to count the corresponding cups.

So there are areas, at every moment, where crimes and misdemeanours are highly concentrated, and the police do not need software to figure that out. These areas evolve over time, depending on the circumstances but also, of course, the presence and actions of the police. Here again, they are already at the forefront of knowing about it.

According to this critique, PredPol is useless. However, the authors do not stop there; they continue, and, citing their sources mainly English, they argue that this technique has adverse effects. The most important is of a political nature, through the mass of statistics analysed by Big Data, crime becomes naturalised. Just as we naturalise road accidents, as revealed by the Yale University apologue analysed earlier, thereby masking the economic and social causes of crime.[25]

However, it's the economic efficiency argument that maintains our attention because it brings us back to the paradoxes of the first part. Since there are fewer burglaries, there is less need for police officers. So there are fewer police officers and, more generally, less public spending on security, and that is a bad thing, we are told.[26] We thought that was the goal! This logic is reminiscent of the circumstances that brought the US-Soviet summit in Reykjavík to a head in October 1986. Reagan and Gorbachev jointly agreed on a goal of the total denuclearisation of the world. Reagan, however, believed that he couldn't return to his country if he were to renounce the construction of a missile defence shield. This, in turn, would violate the 1972 Anti-Ballistic Missile Treaty (ABM) treaty. But since there would no longer be any atomic weapons, Gorbachev kept asking: 'what do you want to protect yourself from?' The paradox, as we

25 Sociologist Ismaël Benslimane says: "Predpol seems to express, in a politically correct way, that thanks to data on a map, that there are more crimes in certain areas of a city, without saying anything about the precariousness of these areas. (...) Predpol is a way to hide a social reality. Instead of saying that it is a poor neighbourhood, we will say that it is a crime zone. This gives a probability value to an offence, whereas one could correlate crime with other factors, such as population density."

26 Sociologist Bilel Boubouzid on Rue89 [Translator's note: Rue89 is a French News Website]: "PredPol, for me, is a right-wing algorithm. It allows for a reduction in public spending and a reduction in the number of people in the police force - in short it saves money."

have seen, is that the present future is not enough, we must also consider counterfactual futures.

We find the same paradox in what Benslimane and Boubouzid tell us of the validation procedures of the PredPol software: it wins at every turn! PredPol will announce that a crime is to take place in a specific area of the city. Off the policeman goes to respond to the situation. One of two things will happen: either a crime takes place as planned and the policeman stops the offender, in which case the PredPol software receives its gold star; or no offence occurs. But this is probably linked to the on the spot presence of the policeman, and so it is still a gold star for the software. We cannot blame PredPol, which prevented the crime.

This is nothing other than the very same paradox we found in Voltaire's *Zadig*. That is to say, the paradox of the prevention of future reported crimes. But what gives us food for thought is that these sociologists criticise PredPol for being so immune to criticism. And yet, they themselves face the exact same paradox; all they want from PredPol, as the prophets of misfortune, is either to predict accurately or to predict not at all. The sociologists' dilemma is the following one: either PredPol's forecasts are proven right and we are ungrateful (when we're not accusing them of being the cause of the reported misfortune), or the crimes just don't occur, the predicted disaster did not happen, and we later mock PredPol's prophetic attitude of doom and gloom (*Cassandra metaphor**) [*attitude de Cassandre*].[27] But Cassandra was condemned to irrelevance by the gods who ordered that her words would always go unheard. It doesn't seem to have occurred to anyone that, if a disaster does not take place, it might be precisely because the advanced warnings were already announced and heard. As Jonah writes:

> The prophecy of doom is made to avert its coming, and it would be the height of injustice later to deride the "alarmists" because "it did not turn out so bad after all." To have been wrong may be their merit.[28]

Translated by Sinan Richards

27 Translator's note: 'attitude de Cassandre' is play on the French expression 'Jouer les Cassandre" which references the Greek mythological prophet 'Cassandra' who was doomed to prophesies real events that no one would believe. It signifies a fatalistic attitude in the text.

*Added by translator

28 Jonas 1984, p. 120
It is very interesting to compare this paradox of Jonah to another Jonah's paradox - this time not Hans Jonas, twentieth-century German philosopher, but of Jonah son of Amittai, the biblical prophet of the 8th century BC mentioned in 2 Kings, 14, 25. Recall the structure of the story:
Now the word of the LORD came unto Jonah the son of Amittai, saying, Arise, go to Nineveh, that great city, and cry against it; for their wickedness is come up before me. But Jonah rose up to flee unto Tarshish from the presence of the LORD,
[King James (Nahum 1:1-15)]
God asks Jonah to prophesies the fall of Nineveh who sinned before the Lord. Instead of doing his job as a prophet, Jonah fled. Why? Nothing is said to us about it. We are all familiar with the rest of the story, they embark on the ship that goes to Tarsis (Strait of Gibraltar), the great punitive storm, the draw that reveals the guilt of Jonah. He is throws overboard, at his own request, by the sailors in order to calm the wrath of Yahweh, the great merciful fish who finally swallows him and, three days and three nights later, vomits him onto dry land. But it is only at the end of the story that we understand why Jonah disobeyed God. It was because Jonah had planned, as an effective prophet, what would happen if he made his prophecy! What would have happened is what is happening now, when Yahweh, for the second time, gives him the order to prophesies the fall of Nineveh and this time, having understood what it costs him to disobey, he obeys. The Ninevites repent, convert, and God forgives them. Their city will be spared. But for Jonah, it's a bitter failure, which leaves him all 'thwarted' [contrarié] says the text. I built my 'Will' [mon Pour] for an enlightened catastrophism (Paris, Seuil, 2002) around the confrontation between these two paradoxes.

Bibliography:

Anderson Chris 2008, The End of Theory, available online at https://www.wired.com/2008/06/pb-theory/

Arendt, Hannah 1994, *Eichmann in Jerusalem. A Report on the Banality of Evil*, (1965), London: Penguin

Atlan Henri 2006, *L'Organisation biologique et la théorie de l'information*, Paris: Seuil

Cukier, Kenneth & Mayer-Schoenberger, Viktor, "The Rise of Big Data. How It's Changing the Way We Think About the World," Foreign Affairs, May-June 2013.

Dupuy, Jean-Pierre 2009, *On The Origins of Cognitive Science: The Mechanization of the Mind*, Cambridge MA: MIT Press.

Jonas, Hans 1984, *The Imperative of Responsibility: In Search of Ethics for the Technological Age*, Chicago/London: The University of Chicago Press.

Kant, Immanuel 1991, *The Metaphysics of Morals*, Cambridge: Cambridge University Press

Kuhn, Thomas 2012, *The structure of Scientific Revolutions*, Chicago/London: The University of Chicago Press

Meyerson, Émile 1991, *Explanation in the Sciences*, Dordrecht: Springer

Pareto, Vilfredo 2014, *Manual of Political Economy: A Critical and Variorum Edition*, Eds., Aldo Montesano, Alberto Zanni, Luigino Bruni, John S. Chipman, and Michael McLure. Oxford: Oxford University Press.

Popper, Karl 2005, *The Logic of Scientific Discovery*, London/New York: Routledge

Sartre, Jean-Paul 2007, *Existentialism is a Humanism*, New Haven & London: Yale University Press

Whither the Transcendental?: Hegel, Analytic Philosophy, and the Prospects of a Realist Transcenden-talism Today

Adrian Johnston

Abstract: Recent developments in Continental metaphysics have involved calls to leave behind the transcendental as first forged by Kant. Against such calls, I plead for a gesture of, to paraphrase Marx, extracting the rational kernel of transcendentalism from the mystical shell of transcendental idealism. I lay claim to Hegel as the key forerunner for this maneuver. Moreover, debates about "transcendental arguments" in Analytic philosophical circles from the mid-twentieth century through today likewise explore the option of a de-idealized transcendentalism. For both Kant and Hegel as well as Analytics participating in the just-mentioned debates, the specter of skepticism looms large over the transcendental. Through putting Hegel's tarrying with ancient and modern skepticisms into conversation with Analytic altercations between transcendentalists and skeptics, I propose a meta-transcendental, genetic-diachronic "error-first ontology" (EFO) as a necessary supplement to any transcendental, static-synchronic epistemology concerned with true knowledge. Prior to the problem of minded subjects coming to know worldly objects, there is the problem of how subjects capable of falling into falsity, illusion, etc. come into being in the first place. This intervention is a prelude to a rapprochement between transcendentalism and a (quasi-)naturalist materialism allied with the natural sciences.

Key Words: Kant, Hegel, Strawson, Stroud, Transcendental, Idealism, Epistemology, Ontology

§1 *Transcendentalism After Idealism: Extracting Kant's Rational Kernel*

For over a decade now, various returns to systematic metaphysics have been a prominent feature of current European philosophy and its multiple spheres of geographic and intellectual influence. Rebelling against the linguistic turns and social constructivisms of the twentieth century, new species of materialisms and realisms have proliferated. They now crowd the contemporary Continental philosophical scene to the point of rendering such terms as "materialism" and "realism" contested and ambiguous, if not outright meaningless through rampant, unchecked overuse.[1]

These present-day materialisms and realisms, many explicitly but some implicitly, share a marked hostility to Immanuel Kant despite their many differences. For Gilles Deleuze and his "new materialist" disciples,

1 Johnston 2013a; Johnston 2017, p. 197; Johnston 2018a

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the critical Kant indeed is an enemy to be feared and loathed.[2] Kant likewise, along with Aristotle, is one of Alain Badiou's historical arch-nemeses, appearing to require vanquishing if philosophy is to reclaim, heeding Martin Heidegger's call, its fundamental ontological vocation[3] (although the Badiou of *Logics of Worlds* and related texts forges a non-Kantian theory of the transcendental dovetailing with some of the efforts I examine below to unshackle transcendentalism from idealism). The so-called "speculative realist" movement in its entirety, partly inspired in its origins by Badiou, sees itself as attempting to undo what it deems the "Kantian catastrophe,"[4] namely, the imprisonment of philosophical speculation within the tight confines of the epistemological prison of subjectivist transcendental idealism. Slavoj Žižek, although a sharp critic of the speculative realists, echoes them in recently declaring it imperative today to move "beyond the transcendental" not only in the form of Kant's own idealism, but also its myriad later permutations (including phenomenologies, structuralisms, and their combinations and offshoots).[5]

So, has the time come, if it is not already overdue, to leave transcendentalism behind? Should one at long last happily bid Kant and his idealism *adieu*? My intervention here seeks to stay the hands that would promptly thrown the transcendental overboard with no second thoughts. I aim to show that certain things well worth saving would be lost in a total and complete break with transcendentalism. The adjective "transcendental" can and should be (re)made to stand for, if nothing else, a cluster of theoretical features/positions involving staunch opposition to unreserved determinisms, eliminativisms, historicisms, reductivisms, and relativisms. For me at least, a key philosophical task is to wed such opposition to a nonetheless uncompromisingly materialist ontological framework not without its historical sensibilities and with a theory of spontaneous, self-determining subjectivity irreducible to both its natural and cultural bases.

Several important questions render my just-indicated marriage of transcendentalism and materialism/(quasi-)naturalism less seemingly oxymoronic. These same questions simultaneously render more debatable cutting-edge Continentalist gestures of jettisoning the Kantian legacy altogether. I ask: What purposes motivated Kant

2 Deleuze 1977, p. 112; Deleuze1995, p. 6

3 Badiou2009a, pp. 118-119; Badiou 2005, pg. 1-2; Badiou 1999, pg. 123-124; Badiou 2006, pp. 30, 133, 141, 163; Badiou 2009b, pp. 267-268, 536; Johnston 2013b, pp. 108-128

4 Meillassoux 2008, p. 124

5 Žižek 2014, pp. 16-17, 98, 109, 372-374

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initially to introduce the transcendental? Whether for Kant and/or his successors, is transcendentalism a strictly epistemological affair? Or, does it actually or potentially encompass ontological dimensions too? In terms of ontology/metaphysics, is transcendentalism inseparable from the subjectivism of transcendental idealism (whether Kantian, Fichtean, Husserlian, etc.)? Or, can the transcendental be detached from the idealisms with which it frequently is associated in the history of philosophy? Is there a transcendental beyond transcendental idealism? If so, can it be synthesized consistently with a materialist (quasi-)naturalism indebted to historical and dialectical materialisms? My answer to these questions, which I seek to show below is at least defensible, is that there indeed is a worthwhile rendition of the transcendental apart from transcendental idealism and its subjectivism, one compatible with a non-reductive materialist ontology.

Within the Continental philosophical tradition, transcendentalism since Kant, in line with the idealism of its late-eighteenth-century inventor, has remained closely associated with subjectivism as well as antipathy to realism, naturalism, materialism, and the like. In the guises of Fichteanism, neo-Kantianism, Husserlianism, and myriad permutations of phenomenology, existentialism, structuralism, and post-structuralism, those associated with the European Continent of the nineteenth and twentieth centuries who either directly or indirectly uphold the consequences of Kant's critical epistemological turn consider the adjective "transcendental" as indissociable from the noun "idealism." Hence, it is no coincidence that recent and contemporary European thinkers urging an abandonment of the transcendental seem to do so largely under the influence of a contestable presumption to the effect that investigations into the necessary conditions of possibility for knowledge are intrinsically idealist in the Kantian subjectivist sense.

By sharp contrast, the Analytic philosophical tradition, from the middle of the twentieth century through today, has interrogated the topic of the transcendental in fashions explicitly questioning whether transcendentalism automatically and unavoidably entails anti-realist idealism too. Starting with P.F. Strawson in the 1950s, Anglo-American philosophers interested in epistemology, philosophy of science, and/or Kant studies have argued about the possibility of a transcendental without Kant's or Kantian-style transcendental idealism. In light of the preceding, it appears that the Analytics already have ventured down a path generally neglected by Continentalists, namely, the route of a non-subjectivist transcendentalism.

Despite the deep-seated and pervasive aversion to G.W.F. Hegel in the Analytic tradition (starting with its early-twentieth-century

founders), Hegel's System stands out amongst the philosophies of the post-Kantian German idealists as a powerful precursor of those Anglo-American philosophers, such as Strawson, who advocate the option of the transcendental *sans* transcendental idealism. Unlike J.G. Fichte's transcendental idealism, Hegel's absolute idealism is anything but an anti-realist subjectivism.[6] And, unlike F.W.J. Schelling's objective idealism, Hegel's absolute idealism takes seriously the epistemological requirements and rigor of Kantian critique. With Kant and against both Fichte and Schelling, Hegel eschews recourse to epistemologically suspect intellectual intuition (the rhetorical means to purported knowledge favored by the pre-Kantian rationalist substance metaphysicians and problematized by the empiricists and Kant alike—it is Fichte and Schelling, not Hegel, who rebel against Kantian critique's ban on intellectual intuition). Insofar as Hegel strives to establish an epistemologically responsible delineation of the real (rather than ideal) and necessary conditions of possibility for, among other things, knowing subjectivity itself, he prefigures later Analytic efforts along similar lines. And, as I will go on to contend here, Hegel has much to teach Analytics who advance or attack realist redeployments of transcendental approaches.

Hence, the rest of my intervention below is devoted to a revisitation of transcendentalism via a superficially counterintuitive rapprochement between Hegelian and Analytic philosophies. The immediately subsequent second section ("The Transcendentalist and the Skeptic: Analytic Arguments") examines controversies amongst Analytics about transcendental arguments from Strawson to the present. Amongst those in this tradition unconvinced by or opposed to transcendentalist philosophical programs, Barry Stroud stands out as having set the agenda for the anti-transcendental camp. Stroud, wielding the doubts of Cartesian-style modern skepticism, makes the case, first and foremost against Strawson, that a realist transcendentalism has little to no chance of success. This is because, for a skeptic doubting whether the rift between thinking and being is ever crossed (or crossed adequately) by a mind actually managing to know the world, Strawsonian-style transcendental arguments look to be permanently plagued by a major difficulty: Even if necessary possibility conditions for knowing on the side of subjects (i.e., the side of thinking/mind) are established by transcendental argumentation, such argumentation still fails to establish such transcendental necessity on the side of objects (i.e., the side of being/world).

6 Johnston 2018b

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As the third section ("Hegel's Doubts: The Self-Sublation of Skepticism") reveals, Hegel has a great deal to say about skepticism in additional to transcendentalism. Indeed, Kant's critical philosophy immediately met with neo-Humean skeptical resistance from some of his contemporaries: in particular, Salomon Maimon and G.E. Schulze. Stroud's skepticism is essentially the same as Schulze's, the latter having doubted the Kantian Copernican revolution as soon as it burst forth on the stage of philosophical history. Thus, Hegel's own responses to Schulze and Schulze's objections to Kant's theoretical philosophy show Hegel to be yet even more relevant to a historically informed assessment of continuing Analytic debates over transcendental arguments.

Hegel also brings into the picture his contextualization of Cartesian and Humean modern skepticisms in relation to ancient varieties of skepticism. Hegel's manners both of playing off ancient against modern skepticism as well as of pressing into the services of a non-skeptical philosophical edifice (i.e., his dialectical-speculative System) the resources of these historical variants of skepticism have two lines of impact with respect to Stroud's brand of (early-)modern skepticism. First, Hegel gives multiple good reasons for doubting what arguably are dogmatic assumptions un-skeptically relied upon by modern skeptics, thereby immanently critiquing and defanging such skepticisms. Second—this is more in the spirit of the side of Kantian critique inspired by the Humean skeptical empiricism likewise inspiring Stroud—Hegel aims to formulate a post-Kantian realist transcendentalism (or, more accurately, meta-transcendentalism) meeting the epistemological imperatives of both modern skepticism and Kantianism by absolutely avoiding any reliance whatsoever upon presuppositions vulnerable to doubts. If either Hegel himself fully succeeds at formulating or at least partly paves the ways towards such a non-subjectivist transcendentalism, then his contributions in this vein are incredibly timely and relevant for both Continental and Analytic philosophical orientations today.

The fourth and final section of my intervention ("Not Transcendental Enough: Too Smart to Ask Stupid Questions") gets underway with a Hegelian return to Strawson as the originator of Analytic controversies about transcendental arguments. Although, as I already have indicated, Hegel sets a precedent for Strawson's later gesture of decoupling the transcendental from Kant's subjectivist transcendental idealism, he would not be comfortable within the confines of the Analytic philosophical context in which Strawson operates. In particular, Hegel (and Schelling along with him) would be dissatisfied with this context, and Strawson along with it, for failing to ask and answer questions about the coming-to-be of transcendental subjectivity itself.

Signaled in advance by an under-appreciated aspect of Schulze's criticisms of Kant's theoretical philosophy, Hegel, along with Friedrich Hölderlin and Schelling, faults the subjectivist idealisms of Kant and Fichte for an unwillingness and/or inability to delineate the genesis of the very subject of their transcendentalisms. Admittedly, it is unclear whether or to what extent Hegel *et al* are aware of their debts to Schulze along these lines. That said, insofar as the genetic dimension missing in both Kantian and Analytic epistemologies traces the pre/non-subjective conditions of possibility for subjective conditions of possibility, the latter being "transcendental" in its standard accepted meaning, this dimension perhaps is best considered meta-transcendental.

This leads me to conclude with some critical supplements to the philosophical sub-discipline of epistemology generally and Analytic epistemology especially. For both early-modern epistemology (up to and including Kant) as well as twentieth-century Anglo-American varieties (as represented by Strawson and Stroud, not to mention Edmund Gettier, among countless others), their pursuits of a satisfactory theory of knowing presuppose as simply given a gap between, on one side, being-world-objectivity and, on another side, thinking-mind-subjectivity. In other words, these epistemologies assume knowledge is a problematic matter of bridging the divide of an unaccounted-for division between the being of worldly objects and the thinking of minded subjects.

But, for Hegelian absolute idealism as well as any non-subjectivist, anti-dualist immanentist or monist philosophical position (including some of the materialisms and/or naturalisms common amongst Analytics themselves), there is a (meta-)problem prior to early-modern and Analytic renditions of the problem of knowledge: If subjects arise from and remain internal to the same substantial reality to which objects also belong, then how do these subjects become unglued from this reality such that they can and do fall into error, illusion, and so on about it? Before asking how knowledge or truth are possible for human beings, one must ask how ignorance and falsity are possible for them. From the standpoint of Hegel's substance-also-as-subject problematic,[7] transcendental epistemology's static-synchronic theory of knowledge requires supplementation by meta-transcendental ontology's genetic-diachronic theory of ignorance. I here baptize the latter a Hegelian "error-first ontology" (EFO), playing off the Analytic label "knowledge-first epistemology" (KFE) associated with Timothy Williamson's fashion of responding to Gettier problems about "justified true belief." At the very end of my text, I will gesture at a subterranean current of EFO within

7 Johnston 2014, pp. 13-107; Johnston 2018b; Johnston 2018c

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recent European intellectual history that includes moments within the reflections of, for instance, Heidegger, Gilbert Simondon, Deleuze, Žižek, and Catherine Malabou, as well as Sigmund Freud and Jacques Lacan too (I deal with Simondon and Malabou along these lines in a companion piece to the present essay[8]).

§2 *The Transcendentalist and the Skeptic: Analytic Arguments*

Ever since the 1959 appearance of Strawson's book *Individuals: An Essay in Descriptive Metaphysics*, the Anglo-American tradition in philosophy has facilitated within itself a number of conversations concerned precisely with the issues I raise in the preceding introductory section of this piece (along with Strawson's *Individuals*, Sydney Shoemaker's 1963 *Self-Knowledge and Self-Identity* sometimes is mentioned as part of this reactivation of transcendental approaches in Analytic philosophy[9]). These discussions and debates are situated at the intersection of Analytic epistemology, philosophy of science, and Kant scholarship. Starting with Strawson himself, Analytics tend to employ the adjective "transcendental" primarily as a modifier of the noun "arguments." Strawson stipulates that such arguments answer questions about how already-furnished solutions to corresponding philosophical problems are possible in the first place.[10] Hence, Strawson's construal of transcendentalism ties it tightly to philosophers' techniques of answering how-possible questions about specific varieties of knowledge. This exerts a lasting pull on subsequent Analytic reflections regarding the transcendental in relation to what Kant himself would call "theoretical philosophy" (as distinct from practical philosophy).

Moreover, Strawson's emphasis on epistemological argumentation sets the stage for Stroud's famous intervention, namely, his 1968 article entitled "Transcendental Arguments."[11] Therein, Stroud insistently portrays transcendental arguments, starting with Kant himself, as motivated entirely by desires to refute various forms of skepticism. In Kant's case, this makes the David Hume who awoke him from his dogmatic slumber the paramount addressee of his theoretical philosophy (regardless of Stroud's skeptical pushback against Kant and his heirs, the least one can say is that Kant's transcendental idealism raises

8 Johnston 2018d

9 Shoemaker1963, pp. 168-169

10 Strawson 1964, p. 40

11 Stroud 1968, pp. 241-256

serious objections to Hume's empiricism and the skepticism Hume ties to it). The skepticism with which Stroud confronts epistemological transcendentalism rests upon the familiar early-modern dichotomy between the thinking of the subjective mind and the being of the objective world.[12]

Stroud's remobilization of this dichotomy leads him to the verdict that transcendental arguments cannot ever succeed as refutations of skepticism. A skeptical anti-realism entertaining radical doubts about the nature or very existence of asubjective external reality (along the lines of the first of René Descartes's *Meditations on First Philosophy*) never will be laid to rest by arguments about what is purportedly *apriori* requisite for subjective cognition and knowing. From Stroud's mid-twentieth-century Analytic perspective, transcendental arguments perhaps can vanquish the relativism of conventionalist accounts of language-dependent knowledge—and this by revealing necessary categorial and conceptual conditions for certain meaningful uses of any and every language. But, Stroud maintains that, even if relativist conventionalism is defeated, the possibility sustaining anti-realist skepticism that mind-independent objective reality still could be completely different from subjects' linguistically-expressed judgments about it is not ruled out by transcendental arguments. This leads to Stroud's conclusion that such arguments ultimately are utter failures insofar as transcendentalism is understood to be at its core an anti-skeptical epistemological endeavor.[13]

At this juncture, a naïve reader might ask regarding Stroud: Is it not the case that Kant is unperturbed by Cartesian-style, "First-Meditation"-type doubts about the relationship (or lack thereof) between thinking and being in light of his distinction between knowable phenomenal objects-as-appearances and unknowable (but thinkable) noumenal things-in-themselves? Does not Kant's transcendental idealism inoculate him against Stroudian skepticism? These questions bring up the importance of bearing in mind Strawson's agenda-setting influence upon Analytic discussions of transcendentalism. In his celebrated 1966 study of Kant, *The Bounds of Sense: An Essay on Kant's Critique of Pure Reason*, Strawson seeks to extract the rational kernel of the transcendental from the mystical shell of subjectivist transcendental idealism[14] (to borrow wording from Karl Marx). As Christopher Peacocke succinctly words this Strawsonian endeavor at the end of an article, "Transcendental

12 Kreis 2015, p. 222

13 Stroud 1968, p. 256

14 Strawson1966, pp. 21-22, 41, 172-174, 197, 235, 242-243, 248-249, 259

investigation need not involve transcendental idealism."[15] Strawsonian transcendental arguments are meant to be capable, at least in some instances, of hitting upon necessary conditions of possibility situated in external reality. That is to say, Strawson, in untying transcendentalism from Kant's transcendental idealism, pushes it to enter into alliance with an outward-looking realism. Therefore, the target of Stroud's skepticism about transcendental arguments is more Strawson than Kant himself.

A number of Stroud's interlocutors have called into question whether he is right to depict transcendentalism as almost entirely preoccupied with the problem of skepticism(s). At a conference in which Stroud was a participant, Günther Patzig observes, "the establishment of an objective world against sceptical doubts is not high up on Kant's philosophical priority list."[16] Of course, this is not to say that Kant was blithely unconcerned about such doubts. Obviously, the "Refutation of Idealism" in the 1787 second edition of the *Critique of Pure Reason*, added in response to unfavorable comparisons of the first edition with the hyper-subjectivist "psychological idealism" of George Berkeley's 1710 *A Treatise Concerning the Principles of Human Knowledge*, seeks to establish the indubitable existence of "an objective world"—albeit within the metaphysical parameters of transcendental idealism.

Yet, this last caveat leaves Kant's "Refutation of Idealism" vulnerable to refutation in turn by Stroud's Cartesian-style skepticism. For Stroud, the most that this Kant can prove at best is an intersubjective necessity for all subjects to experience phenomena as situated within what appears to be an external reality *qua* spatio-temporal expanse of existence. But, this intersubjective necessity proves nothing as to whether there really is, apart from subjects (and the outer and inner senses of their ideal pure forms of intuition), an external reality and, if such a reality actually exists, what it amounts to in truth. On a Stroudian assessment, Kant's foundational idealist contrast between phenomena/objects and noumena/things already concedes and cements in place the skepticism-generating subject-object/mind-world gap.

Quassim Cassam takes issue with Stroud's wholesale equation of transcendentalism with anti-skepticism.[17] He remarks that, "this is not the best or, at any rate, the only way of conceiving of transcendental arguments."[18] Cassam's alternate suggestion is to view such arguments

15 Peacocke 2009a, p. 768

16 Patzig 1979, p. 71

17 Cassam 2007, pp. 54, 56-57

18 Ibid., p. 56

as regressive analyses aiming to reverse-engineer out of a given phenomenon this phenomenon's necessary conditions for occurring/being.

I will not go into Cassam's reasons for considering regressive transcendental arguments unlikely to be informative or successful. These are different from Stroud's objections, and have to do with the alleged over-generality and abstractness of typical identified possibility conditions for knowledge. For what it is worth, I am sympathetic to Peacocke's defenses of the philosophical value of admittedly general and abstract transcendental arguments against Cassam's complaints.[19] I also second Peacocke's praise of Cassam's anti-subjectivist realism.[20]

That said, two other of Cassam's observations regarding transcendentalism are important to note for my purposes. First, Cassam, like select others and following in Strawson's footsteps, urges decoupling the transcendental from transcendental idealism.[21] On one occasion, he does so in the context of distinguishing between "world-directed" and "self-directed" transcendental arguments: The former seek *apriori* necessary conditions for knowledge in the *Umwelt* of objectivity and the latter in the *Innenwelt* of subjectivity.[22] As Paul Franks notes, this distinction between world-directed and self-directed transcendental arguments opens up the option of conceding to Stroud's skepticism the futility of world-directed transcendental arguments while maintaining the (potential) viability of self-directed ones.[23]

Although it might initially seem that self-directed transcendental arguments at least would have to be anchored in transcendental idealism, Cassam severs even these from such subjectivist, anti-realist idealism. He does so utilizing the figure of a "conceptual realist" who proposes that what intrasubjectively make possible the subject's knowledge are metaphysically real categories and concepts enjoying subject-independent existence (with these metaphysical realities thereby being, in Lacanese, "extimacies" in the subject more than the subject itself). For this figure, a successful Cassamian regressive self-directed transcendental argument manages to dig down to the spade-turning bedrock of metaphysically real categorial/conceptual possibility conditions enabling instances of subjective knowing.[24]

19 Peacocke 2009a, pp. 763-766; Peacocke 2009b, p. 733

20 Peacocke 2009b, p. 737

21 Cassam 1987, pp. 355-378

22 Cassam 1999, p. 87

23 Franks 2005, p. 252

24 Cassam 1999, pp. 89-90, 101, 104-105

Interestingly, when Cassam considers the option of self-directed transcendental arguments divorced from the subjectivism of classical Kantian transcendental idealism, he entertains only the just-glossed conceptual/metaphysical realist possibility. He does not even mention the idea of materialist or naturalist self-directed transcendental arguments. I strongly suspect that Cassam would consider any line of argumentation linking transcendentalism to materialism or naturalism to be world-directed rather than self-directed—and this presumably because, for him, directing attention to anything material or natural is shifting focus onto the "world" as opposed to the "self." On this assumption, materializing or naturalizing the self is reducing it to being a mere part of the world.

However, if Cassam is willing to categorize a conceptual/metaphysical realist transcendental approach as self-directed, it seems it would be difficult for him to exclude the possibility of materialist/naturalist self-directed transcendental arguments (if he indeed would uphold such an exclusion). Why? Conceptual/metaphysical realisms posit categorial forms that, as "real," are at least as much structures of the world as of the self. On such accounts, the self would be a moment of or participant in the objective formal realities constituting and configuring the world. That is to say, a conceptual/metaphysical realist transcendental argument would be no more and no less world-directed than a materialist/naturalist transcendental argument.

If identifying objective conceptual/metaphysical realities as conditions of possibility for subjects' knowings is self-directed, why would identifying objective material/natural realities as the same not count as equally self-directed? Assuming Cassam in fact would rule out the option of materialist/naturalist self-directed transcendental arguments, he appears to be in the grip of an unacknowledged Cartesian hangover (just as Stroud avowedly remains in the grip of Descartes's "First Meditation"[25]). To be more precise, only if one presupposes that selfhood/subjectivity is a mental *Innenwelt* as essentially different-in-kind from a physical *Umwelt*—this would be to endorse some version of Descartes's ontological dualism between *res cogitans* and *res extensa*—is one justified in simultaneously affirming conceptual/metaphysical realist approaches and denying materialist/naturalist ones as possible options for self-directed transcendental arguments (with there being a perceived kinship between mindedness and metaphysically real concepts ostensibly lacking between mindedness and the physical universe). Correlatively but conversely, if one allows for some link or links (however specified)

25 Stroud 1968, pp. 277-278, 293-294

between the material/natural and selfhood/subjectivity, then the project of materialist/naturalist self-directed transcendental arguments is at least a potentially promising program not to be preemptively shut down in the absence of explicit and precise reasons.

Regardless of whether Cassam would grant the coherence and feasibility of materialist/naturalist self-directed transcendental arguments, he still separates transcendentalism from transcendental idealism by allowing for materialist/naturalist transcendental arguments—if only as world-directed and hypothetically. I will return momentarily to Analytic reflections upon the relationship (or lack thereof) between the transcendental and transcendental idealism. As I already indicated, Cassam is not alone amongst Analytic epistemologists, philosophers of science, and Kant scholars in raising doubts about transcendentalism being inseparable from subjective idealism.

Before turning from Cassam to other Analytics, there is a second move of Cassam's crucial to my agenda. In a bit of unwitting Hegelianism,[26] Cassam insists, against Kant, upon the underlying contingency of transcendental necessity.[27] He objects to Kant's tendency to treat what is transcendentally *apriori* as always and automatically necessary too.[28] Whether there are valid and good transcendental arguments apropos human knowing, through which *apriori* necessities for such knowing are brought to light, depends upon there being human knowers. But, the fact of there being human knowers at all, and, hence, *apriori* necessities for human knowing, is itself ultimately contingent (unless one falls back upon some sort of religious-style teleological narrative about the preordained, inevitable genesis of humanity).

Drawing on Hegel's treatment of modalities,[29] I should add that it might be helpful to reconceive at least some instances of the transcendental as retroactively necessary. These would be instances of what will have been a necessary condition of possibility if certain possibilities subsequently are realized as actualities. In other words, rather than transcendental necessity being a present and/or permanent status inherent to a given "x" in and of itself, it might be a temporal and transient modal determination conferred upon an "x" in an *après-coup*, future-anterior relationship with other variables. Such transcendentals would be initially non-transcendental-*qua*-contingent factical actualities

26 Johnston 2018b

27 Cassam 1999, p. 99

28 Ibid., p. 100

29 Johnston 2018b

that become properly transcendental-*qua*-necessary conditions of possibility only if and when specific subsequent actualities come to depend upon them in specific manners. Indeed, it does not seem to be much of a stretch to apply Hegel's motif of the becoming-necessary of the contingent to considerations of the transcendental. Maybe there are transient transcendentals.

Cassam's manner of insisting upon the contingency of necessity implicitly (and reasonably) presumes as well-established the historicization of nature such that human beings are relatively recent products of evolutionary processes operative on planet earth. Rendering the transcendental contingent as Cassam does amounts to pointing out its boundedness to humans who are themselves accidental, temporary outgrowths of natural history. Ross Harrison, who, like Cassam, suggests separating the transcendental from transcendental idealism,[30] appeals to evolution (incidentally, both Harrison and Peacocke contend that the inconsistencies and implausibilities plaguing Kant's transcendental idealism compromise the cogency and effectiveness of his own transcendental arguments, with the latter rendered stronger by ditching subjectivist anti-realism[31]). Cassam overtly associates transcendentalism with contingency and covertly embeds transcendental subjects within a historicized nature. Harrison presents a complementary inversion, overtly situating transcendental subjectivity within evolutionary history and covertly indicating the ultimately contingent status of anything transcendental.[32]

Curiously, Stroud too gestures in the direction of a historicized nature. His seminal article on "Transcendental Arguments," intervening specifically within mid-twentieth-century Analytic debates about transcendentalism, is colored by the "linguistic turn" sensibilities of his philosophical fellow travelers. As such, Stroud is primarily concerned with transcendental argumentative strategies proceeding by way of analyses of language. The *apriori* necessities put forward by these types of Analytic transcendental arguments would be compulsions and constraints bearing upon all languages in their articulations of knowledge claims.[33]

In this context, Stroud observes in passing that language *tout court* has not always existed and will, at some point in the future,

30 Harrison 1982, pp. 211-224

31 Harrison 1982, pp. 218-219; Peacocke 2009a, p. 767

32 Harrison 1982, pp. 223-224

33 Stroud 1968, pp. 243-244

cease to exist altogether.[34] Such an observation is in the same vein as Cassam's implicit and Harrison's explicit invocations of accident-ridden, non-teleological evolutionary sequences. Like Cassam and Harrison, Stroud acknowledges that such structures as knowledges and languages are linked to human beings, who themselves have arisen from and will dissipate back into an expanse of natural history exceeding them in the directions of both the past and the future. For Cassam and Harrison, such an acknowledgment is unproblematic, being of a piece with their opting for realist against (transcendental) idealist positions. But, for Stroud, this same acknowledgement is in tension with his anti-realist skepticism. Although Stroud considers the skeptical scenarios of Descartes's "First Meditation" to remain grave difficulties for all philosophers, he looks to be momentarily (and inconsistently) untroubled by them in his casual recourse to the realist outlook of the modern natural scientific *Weltanschauung*.

David Bell is an author who takes a step back from Analytic disputes about transcendental arguments to call into question whether the transcendental ought to be limited to serving as an adjective for the noun "arguments." Bell comments:

> Another widespread belief... is that it is permissible, perhaps even mandatory, to construe the adjective 'transcendental' as though its primary function were to modify the term 'argument.' This is to be regretted; for, construed in this way, a number of conceptual (and historically significant) connections are either severed or, at best, marginalized. And so on the one hand, for instance, there is a tendency to treat an argument that is deemed to be 'transcendental' in a way which leaves its nature and purpose quite unconnected with the nature and purpose of, say, a transcendental theory, a transcendental explanation, a transcendental concept, or a transcendental point of view. And on the other hand, the concept *transcendental* is typically employed in isolation from the complex web of connections and contrasts in which it stands to such other concepts as *immanent*, *transcendent*, *empirical*, *naturalistic*, *dogmatic*, and so forth.[35]

Bell's remarks suggest that Analytics too quickly and presumptively restrict the sense of the transcendental to epistemological issues within the relatively narrow parameters of the Anglo-American version of the linguistic turn. In so doing, they neglect, without explicit argumentative

34 Ibid., p. 254

35 Bell 1987, pp. 193-194

justifications, numerous other senses of "transcendental" in the history of philosophy from Kant onwards. In particular, some of the words and phrases employed by Bell signal that various metaphysical and ontological dimensions of transcendentalism quietly are excluded from the conversations about "transcendental arguments" in an unexplained and, perhaps, unjustifiable fashion.

It would be inaccurate simply to map the difference gestured at by Bell between epistemological and ontological dimensions of transcendentalism onto the divide between Analytic and Continental philosophical traditions—with the former focused on epistemology and the latter devoted to ontology. This is primarily because there is plenty of emphasis upon transcendental epistemology and methodology on the European Continent over the course of the past two centuries. However, such emphasis monopolizes the past half-century of Anglo-American discussions of transcendentalism (as transcendental arguments) in a way it does not within mainly German and French developments unfolding under Kant's long shadow.

Michael Rosen, like Bell, challenges the Analytic habit of soldering the adjective "transcendental" to the noun "argument."[36] In dialogue with the work of Franks, he contends that, at least for Kant's immediate German idealist successors, transcendentalism has more to do with matters of ontological genesis (first and foremost, how substance becomes subject, to put it in Hegel's phrasing) than epistemological structure.[37] Rosen similarly divorces post-Kantian German idealist transcendentalism from Stroud's early-modern problematic of veil-of-appearances skepticism.[38]

Bell's and Rosen's dovetailing assertions are brought into even more direct and precise connection with the post-Kantian German idealists by Jonathan Vogel. The degree of Vogel's awareness of the connection I have in mind is unclear. Nonetheless, however intentionally or not, some of his observations echo a pivotal text in the emergence of a post-Kantian idealism leaving behind the subjectivism of Kant's and Fichte's transcendental idealisms, namely, the 1796 fragment "The Earliest System-Program of German Idealism" (a piece of contested authorship, with Schelling, Hegel, Hölderlin, and Isaac von Sinclair all hypothesized as possible authors, although the fragment is in Hegel's handwriting). These resonances are audible when Vogel writes:

36 Rosen 1987, pp. 152-153

37 Ibid., pp. 152-153

38 Ibid., p. 153

> Idealism closes the gap between thought and the world by dissolving the latter into the former. Naturalism, too, refuses to see thought and the world as fundamentally distinct; the naturalist seeks to locate thought within the material realm. This project gives rise to the question, 'What must the metaphysics of the natural world be, so that thought can be accommodated within it?' And this question may have some interesting, non-trivial answers.[39]

What Vogel says about "idealism" in the first sentence of this quotation holds for Kantian transcendental idealism, but not, as he fails to note, for the "objective" and "absolute" idealisms of Schelling and Hegel in particular (both of which reject the anti-realist and anti-naturalist subjectivism of Kant's and Fichte's idealisms). In fact, with Schelling's and Hegel's system-building approaches both mobilizing their differing versions of *Naturphilosophie*, their objective/absolute idealisms involve not only naturalism, but also a naturalism oriented by Vogel's very question (i.e., "What must the metaphysics of the natural world be, so that thought can be accommodated within it?"). The Schellengian and Hegelian *oeuvres* monumentally testify to the "interesting" and "non-trivial" responses generated by attempts to wrestle with this line of inquiry. Vogel's question should be heard as a rewording (however witting or unwitting) of the central query of "The Earliest System-Program of German Idealism": "how must a world be constituted for a moral entity?"[40] Regardless of the actual original authorship of this 1796 fragment, the subsequent philosophical trajectories of Schelling and Hegel are both profoundly shaped by efforts to answer this.[41]

Having discussed at length "The Earliest System-Program of German Idealism" and its resonances with Schelling's and Hegel's ensuing intellectual itineraries elsewhere,[42] I will not go into detail about this topic here. Suffice it in the current context to appreciate how and why Bell, Rosen, and Vogel, intervening directly into Analytic conversations about the transcendental, all varyingly invoke the post-Kantian aftermath as of enduring philosophical relevance (rather than merely historical/antiquarian interest) apropos the topic of transcendentalism as still a live option. In line with Bell's, Rosen's, and Vogel's interventions, the next

39 Vogel 1987, p. 226

40 Hegel 2002, p. 110

41 Kimmerle 1970, p. 18; Düsing 1976, pp. 53-54, 214; Henrich 1982, p. 188; Pöggeler 1984, pp. 132-133; Bienenstock 1992, p. 147; Vaysse 1994, pp. 126-127; Bonsiepen 1997, pp. 272-273, 281; Bowman 2013, pp. 38, 227, 229-230, 247-248, 257-258

42 Johnston 2014, pp. 13-49, 308-312; Johnson 2018b; Johnston 2018c

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section of my essay will extract from Hegel resources for reconfiguring recent and contemporary controversies about the transcendental.

Specifically, I will utilize Hegel's reflections on the ontological implications of the epistemological problems of skepticism and fallibility to undermine both of the two main sides (although not the only ones) of the Analytic debate about the transcendental as I have outlined it in the present section. These two factions are well-represented by the proper names "Strawson" and "Stroud." The Strawsonian side upholds the viability of world-directed transcendental arguments free of the subjectivist anti-realism of Kantian transcendental idealism. Against this, the Stroudian side brandishes an early-modern, pre-Kantian skepticism insisting upon a strict subject-object opposition (i.e., mind-versus-world, thinking-versus-being) and maintaining that this opposition renders insurmountably dubitable realist transcendental arguments (such as those of Strawson).

As I will go on to show below, a Hegelian approach to these Analytic disagreements about transcendentals permits problematizing both the Strawsonian and Stroudian positions. As regards Strawson and his descendants (such as, for example, Peacocke[43]), I should begin by avowing that I interpret Hegel as likewise invested in the project of preserving some sense (or senses) of the transcendental after discarding the husk of Kant's transcendental idealism. In this vein, I agree with Kenneth Westphal both that Hegel anticipates Strawson's transcendental-without-transcendental-idealism as well as that a difference between Hegel and Strawson is that the latter strictly limits this desubjectivized transcendental to the linguistic alone[44] (I delve into other important differences between Hegel and Strawson in the fourth section below). Without the space to explain and defend this interpretation at the moment, I will limit myself to claiming for now that Hegel's interlinked *Logik* and *Realphilosophie* (i.e., the framework of his encyclopedic System) involve an anti-subjectivist transcendentalism anticipating such things as Strawson's transcendental-*sans*-transcendental-idealism.

But, the critical twist comes with Hegelianism's not entirely friendly supplementation of Strawson's static-synchronic perspective with a genetic-diachronic angle. A Hegelian would insistently inquire after and pursue, behind or beneath Strawson's non-transcendental-idealist possibility conditions for the subject's thinking and knowing, the real possibility conditions for the being/existence of this very subjectivity

43 Peacocke 2009a, pp. 739-769

44 Westphal 2003, p. 60

itself. This would amount to Strawson's epistemological transcendentals being supplemented by Hegel's ontological meta-transcendentals. Moreover, insofar as the Hegelian Real of *Realphilosophie* brings with it natural strata, the above-glossed, cross-resonating questions raised by both "The Earliest System-Program of German Idealism" and Vogel would have to be asked and answered by any such meta-transcendental ontology. I will return to these matters in the fourth and final section of this intervention.

However, the following third section will get underway momentarily with the significant problems Hegel's philosophy poses for the Stroudian side of the Analytic debate about transcendental arguments. As various scholars already have appreciated, Hegel has quite a lot to say about skepticism. He directly tackles the modern forms of skepticism from Descartes through the British empiricists and their German offspring (such as F.H. Jacobi and Schulze). These forms are the ones redeployed by Stroud himself. In parallel, Hegel contrasts modern with ancient skepticism to the detriment of the former. As I will now proceed to argue, Hegel's characteristically immanent-critical handling of skepticisms is directly relevant to Analytic skeptics such as Stroud—and this despite these Analytics evidently being unaware of and unresponsive to such Hegelian contributions as well as to post-Kantian German idealism in general.

§3 *Hegel's Doubts: The Self-Sublation of Skepticism*

Franks, at several points in his excellent 2005 study *All or Nothing: Systematicity, Transcendental Arguments, and Skepticism in German Idealism*, appropriately relates the mid-twentieth-century-through-present Analytic epistemological tussles about transcendental arguments and skepticism back to the original rise of Kantian transcendentalism and its immediate post-Kantian reverberations. In so doing, he compares Stroud in particular to two figures shaping the transition from Kant to his German idealist successors: Jacobi[45] and Schulze.[46] Like Jacobi,[47] Stroud has recourse to early-modern skepticism generally, and Humean skepticism specifically, in pushing back against anything transcendental *à la* Kant. And, like the neo-Humean Schulze,[48]

45 Franks 2005, p. 156

46 Ibid., pp. 246-248, 290

47 Jacobi 1994, p. 292

48 Schulze 1911, pp. 15, 18, 21-22, 77-79

Stroud denies that Kantian-style transcendental arguments succeed at vanquishing the specter of a curtain of inaccurate or false appearances draped between subjective mind and objective world. Moreover, Stroud's insistence that vanquishing Humean skepticism is the overriding top priority of the *Critique of Pure Reason* already is to be found in Schulze's 1792 *Aenesidemus*.[49]

Franks is right to see little difference between Jacobi and Schulze at the end of the eighteenth century and Stroud in the middle of the twentieth century. This looks an awful lot like a straightforward case of those not knowing history being doomed to repeat it. Even Strawson, in *The Bounds of Sense*, observes with respect to Kant's epistemological insights that, "These are very great and novel gains in epistemology, so great and so novel that, nearly two hundred years after they were made, they have still not been fully absorbed into the philosophical consciousness."[50] Strawson reaffirms this damning 1966 verdict apropos Analytic epistemology in a 1999 exchange with Westphal.[51] The latter, a specialist in German idealism who is himself no stranger to the sub-discipline of Analytic epistemology, agrees with Strawson and portrays the sequence of Anglo-American theories of knowledge as "a century-long anachronistic detour" regressing back behind both Hegel and Kant.[52] Forster similarly alleges that Analytics ignore both ancient skepticism and Hegelian epistemology, relying instead almost exclusively on the early-modern veil of perception generally and its Humean unfurling specifically.[53]

If what Strawson and Westphal concur regarding the Analytic uptake (or lack thereof) of Kant is in fact true, the failure of the Anglo-American tradition to absorb the many significant lessons from Hegel's philosophy is even more total and complete. With a few notable exceptions, such as the leading representatives of the Pittsburgh and Chicago camps of Analytic neo-Hegelianism, the early-twentieth-century rubbishing of Hegel by Bertrand Russell and company in their break with nineteenth-century British Hegelianism made non-engagement with Hegel's philosophy the enduring norm amongst Analytics. As I hope to show in what follows, Analytic types suffer greatly, without really knowing it, from their congenital Hegel allergy.

49 Ibid., pp. 73-74

50 Strawson 1996, p. 29

51 Westphal 2003, p. 88

52 Ibid., p. 88

53 Forster 1998, pp. 189, 192

The controversies about transcendental arguments and skepticism drawing in Analytic epistemologists, Kant scholars, and philosophers of science powerfully show the prices paid and problems perpetuated by disdain for and ignorance of Hegel's various contributions. As already documented by several scholars—I will be citing these scholars below—Hegel has quite a bit to say about skepticism, including the varieties featuring centrally in Analytic debates about transcendentalism. Of course, Hegel also obviously has an enormous amount to offer anyone concerned with Kant, the transcendental, and idealism. The utter neglect of Hegelian ideas and arguments in the past half-century-plus of Analytic clashes over transcendentalism *vis-à-vis* skepticism is simply indefensible.

I will not reconstruct here in painstaking detail everything Hegel has to say across the arc of his intellectual itinerary about the topic of skepticism. Others already have performed this exegetical labor more or less thoroughly (especially, in the English-language literature, Michael Forster). After merely sketching Hegel's various responses to things skeptical, I will focus on those of his responses most relevant to reconsiderations of the transcendental, particularly in light of tensions along the above-delineated fault line between Strawsonian- and Stroudian-style stances. I will elaborate Hegelian problematizations of Stroudian skepticism in the present section and then of Strawsonian transcendentalism in the subsequent section.

Undoubtedly, the place to begin in any assessment of Hegel in relation to skepticisms, both chronologically and philosophically, is his Jena-period 1802 essay "On the Relationship of Skepticism to Philosophy, Exposition of Its Different Modifications and Comparison of the Latest Form with the Ancient One." This lengthy rebuttal of Schulze's *Aenesidemus*—as Forster rightly asserts, Schulze here stands in for modern skepticism as a whole from Descartes through the eighteenth-century British empiricists[54]—was published in the *Kritisches Journal der Philosophie* Hegel was co-editing with Schelling at the time. The tail end of this essay's lengthy title already announces a key feature of Hegel's approach to skepticisms: his historical appreciation and philosophical redeployment of the differences between ancient and modern forms of skepticism (with Schulze's neo-Humeanism as "the latest form" of modern skepticism).[55] Schulze will resurface in the subsequent fourth section of my intervention in terms of a neglected contribution his *Aenesidemus* makes to Hegel's own philosophical development.

54 Forster 1989, pp. 188-189

55 Pippin 1989, p. 96

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Hegel's main move is to play off ancient against modern skepticism to the disadvantage of the latter.[56] In terms of the ancients, Hegel has in mind not only the skeptics themselves, but also such figures as the Plato of the *Parmenides* dialogue. What the Pyrrhonists and this Plato share in common, on the Hegelian account, is the exercise of the art of dialectic, namely, the pitting of competing propositions against each other so as to undermine commitment to any one or several of these propositions. In Plato's *Parmenides*, core categories grounding all thinking and knowing are destabilized without the closure of restabilization. In the *Science of Logic*, Hegel, with an eye to his own *Logik* as centrally involving a dialecticization of all categories, points out that the ancient variety of dialectics assaults the very roots of propositions, rather than getting bogged down in the infinite task of attacking particular individual propositions taken one-by-one[57] (in his later Berlin-era *Lectures on the History of Philosophy*, Hegel further reinforces the link between his and Plato's dialectics by highlighting the kinetic negativity the latter introduces into categories and concepts[58]). And, Pyrrhonism relies upon confronting all claims with equally powerful counter-claims so as to arrive at *ataraxia* through this equipollence giving rise to the liberating suspension of belief *tout court* (i.e., *epochē*). This ancient art of dialectics is precisely what Hegel credits the Kant of "The Antinomies of Pure Reason" with redeploying at the end of the eighteenth century.[59]

Already in 1802, Hegel envisions a philosophy moving both beyond the conflict between more recent skepticism (to be found mainly, but not exclusively, on the side of the early-modern empiricists) and outright dogmatism (epitomized by the rationalist substance metaphysics of such figures as Nicolas Malebranche, Baruch Spinoza, and G.W. Leibniz) as well as beyond the Kantian critical adjudication of this same conflict (an adjudication bound up with Kant's subjectivist transcendental idealism).[60] This philosophy, which becomes Hegel's own scientific, encyclopedic System with its speculative dialectics, would integrate skepticism without itself becoming fully skeptical as a result.[61] The mature Hegel, in his *Lectures on the History of Philosophy*, echoes this relatively youthful

56 Hegel 2000, pp. 322-323, 330, 332; Hegel 1991, §39 p. 80; Hyppolite 1974, pp. 185-186; Inwood 1992, p. 264

57 Hegel 1969, p. 191; Forster 1989, pp. 127-129, 155, 173

58 Hegel 1955a, pg. 49

59 Hegel 1969, pp. 190-192; Hegel 1991, §81 p. 129-130; Hegel 1955b, p. 450; Hegel 1984, p. 281

60 Hegel 2000, pp. 322-323

61 Ibid., pp. 322-323

vision.[62] In the *Encyclopedia Logic*, he specifies that ancient skepticism specifically is the sort representing an essential moment of true philosophy.[63]

The systematic Hegel of maturity, from the 1807 *Phenomenology of Spirit* onward, unwaveringly insists that the thoroughgoing skepticism of the ancients embodies an indispensable dimension of proper philosophizing. In Hegel's own post-Kantian manner, he differentiates between reason (*Vernunft*) and the understanding (*Verstand*). The latter is reflected in all exercises of sapience (whether common-sensical, philosophical, etc.) treating as absolute the dichotomizing laws of classical, bivalent logic. Relatedly, Hegel is aware that ancient skepticism, by contrast with the modern sort, does not stop short of calling into question even the fundamental laws (identity, contradiction, excluded middle) of (this) logic.[64]

According to Hegel, the binary, black-and-white understanding is always prone to undermining itself, vulnerable to seeing its own distinctions and oppositions becoming problematic by its own lights if and when it is made to look at them closely enough. Hence, in his *Lectures on the History of Philosophy*, Hegel asserts that *Verstand* can and does give rise out of itself to skepticism, namely, profound doubts about even its most foundational categories, concepts, and inferential procedures.[65] Ancient skepticism is portrayed in this same context as epitomizing these doubts immanently produced in and by the understanding.

In the mature Hegelian System, the understanding gets inseparably linked with reason. The latter exhibits two sides: one being the negativity of dialectics and the other being the positivity of speculation. *Verstand* sublates itself into the negative side of *Vernunft* through its auto-dialecticization, via its self-subversion of its own commitments, principles, and rules. The positive side of reason brings about speculative resolutions (however ambiguous and contested these might look to various of Hegel's readers) of the dialectical difficulties generated at the intersections of the understanding and the negative side of reason. Hegel is adamant that all three of these dimensions (i.e., *Verstand* and the two aspects of *Vernunft*) are equiprimordial moments of genuinely philosophical thinking, namely, the speculative dialectics of absolute

62 Hegel 1955a, pp. 330, 358, 363-364, 366

63 Hegel 1991, §81 pp. 130-131

64 Forster 1989, pp. 193-197; Inwood 1992, p. 264

65 Hegel 1955a, p. 365

idealism as per Hegel's System *als Wissenschaft*.[66]

Therefore, if ancient skepticism amounts to dialectical reason confronting the understanding with the latter's own contradictions and inconsistencies, then this skepticism, as equivalent to *Verstand*-generated negative *Vernunft*,[67] is indeed, for Hegel, inherent to authentically philosophical cognition. Correlatively, and starting in 1802, he maintains that dialectical-speculative philosophy, as rational, has nothing to fear from such skepticism insofar as skepticism's doubts bear upon only the claims and arguments of the understanding and not upon reason too.[68] Relatedly, in his post-Jena *Logik*, he contends that his logical dialectic of negative reason renders skepticisms put forward as independent philosophical positions unto themselves superfluous.[69]

But, what about Hegel's fundamental contrast between ancient and modern skepticism? What does this involve and how is it relevant to more recent epistemological disputes between transcendentalists and skeptics (such as Stroud) as I already have sketched these above? I now will proceed to answer these questions.

Hegel considers modern skepticism to be epitomized by Descartes's "First Meditation." These Cartesian doubts presuppose a split between, on one side, the thinking of minded subjectivity and, on another side, the being of worldly objectivity. On the basis of this presupposed divide, such skepticism sets about raising doubts about whether there is any correspondence between the two separated sides and, if so, whether such correspondence is sufficiently accurate to constitute true knowledge.

The core skeptical worry here is that the thinking of minded subjectivity is entirely, hopelessly mired in mental contents that are wholly fictitious, devoid of any ties to real entities and events in the being of worldly objectivity. Maybe all mental content forms nothing more than a web of illusory appearances woven of unreal dreams and delusions. Although Descartes is a Continental rationalist, the means of his method of radical skepticism are taken up after him as symptomatic of major metaphysical issues primarily by such British empiricists as John Locke, Berkeley, and Hume. Mainly due to Hume's influence, Kant,

66 Hegel 1977, pp. 18-19; Hegel 1969, pp. 28, 610-612; Hegel 1991, §79 p. 125, §80 pp. 126-128; Hegel 1971, §467 pp. 226; Hegel 2008, §79 p. 72, §81 p. 73; Harris 1972, p. 176; Harris 1997, pp. 49, 265; Düsing 1976, pp. 210, 246; Elder1980, p. 39; Bourgeois 2000, pp. 119-120; Beiser 2005, p. 164; Johnston 2018b

67 Hyppolite 1974, p. 188; Hyppolite 1977, p. 70; Fulda 1965, pp. 36, 43

68 Hegel 2000, p. 332; Hegel 1955a, pp. 330-331, 344, 367-369; Forster 1989, pp. 107-108

69 Hegel 1969, pp. 831-833; Hegel 1991, §78 pg. 124, §81 pg. 128

as Hegel views him, also is affected to his detriment by such Cartesian veil-of-appearances skepticism (on display first and foremost in the guise of Kant's subjectivist transcendental idealism as structured around the empiricist-type purported limits of possible experience partitioning objects-as-appearances from things-in-themselves).[70]

In terms of Hegel's contrast between ancient and modern skepticism, the latter, in light of the former, is insufficiently skeptical.[71] As I hint in the preceding paragraph, Cartesian-style skepticism is not skeptical about its presupposition of certain versions of thinking-being, mind-world, subject-object dichotomies. On a Hegelian interpretation of the history of philosophy, ancient skeptics would not have hesitated to deploy doubt-inducing equipollence tactics against this (dogmatic) assumption of modern skepticism.

Furthermore, Hegel emphasizes that modern skeptics, unlike ancient ones, fail to call into question how things appear to them.[72] In other words, they presume that, even if the appearances they experience are inaccurate *vis-à-vis* mind-independent objective reality, this experience itself is accurate *vis-à-vis* these same appearances. Although thinking is fallible with respect to the extra-mental/subjective, it is infallible with respect to the intra-mental/subjective.

For both Hegel and the ancient skeptics on his construal of them, even the experience of appearances cannot be assumed really to be what it superficially seems and is taken to be by the experiencing subject. At one point in the *Phenomenology*, Hegel observes, "What Scepticism causes to vanish is not only objective reality as such (*das Gegenständliche als solches*), but its own relationship to it (*sein eigenes Verhalten zu ihm*)."[73] Modern skepticism makes "objective reality as such" disappear behind the other side of its veil, but not how this supposed reality manifests to it on this side of its veil (i.e., "its own relationship to it"). In the mature Logic, Hegel likewise stresses that modern skepticism *à la* the empiricists fails to be consistently and consequently skeptical in refraining, by contrast with ancient skepticism, from going so far as to question how things appear to conscious experience.[74]

The entire main body of the 1807 *Phenomenology* can be taken as centrally involving a calling-into-question even of whether things

70 Hegel 1969, pp. 396, 777; Pippin 1989, p. 168

71 Hegel 2000, p. 339; Pippin 1989, p. 96; Forster 1989, p. 11-13, 200; Forster 1998, pp. 132-134, 149

72 Forster 1989, p. 189, 221; Inwood 1992, p. 264

73 Hegel 1970a, p. 160; Hegel 1977, p. 124

74 Hegel 1969, p. 396; Hegel 2008, §32 pg. 25, §38[pg. 28

really appear to experiencing subjects as these subjects initially and spontaneously register and interpret these very appearances. On this phenomenological-dialectical "pathway of *doubt*" (*der Weg des* Zweifels) or "way of despair" (*der Weg des Verzweiflung*),[75] each figure/shape (*Gestalt*) of consciousness undoes itself by discovering that what it habitually took its experiences to be and be about (i.e., what this consciousness seemed to be "for itself" [*für sich*]) turns out not to be what these experiences truly are and are about (i.e., what this consciousness actually is "in itself" [*an sich*]). An idea at the very core of the dialectics unfurled in the *Phenomenology of Spirit*, one Hegel credits the ancient skeptics (unlike modern ones) with foreshadowing, is that subjects can be mistaken even about what they consciously experience and how their appearances truly appear to them. Of course, this key Hegelian thesis paves the way for and is retroactively reinforced by the suspicions associated with such subsequent figures as Friedrich Nietzsche, Marx, and Freud (with these post-Hegelian "masters of suspicion" arguably being locatable within the skeptical traditions of interest to Hegel himself). From the nineteenth century onward, history, ideology, and the unconscious add to ancient-skeptical and Hegelian-dialectical reasons for doubting that various forms of conscious mindedness and like-mindedness reliably can know in truth even what and how they experience.

At this juncture, it should be self-evident that Hegel would treat Stroudian skepticism as no different-in-kind from the modern varieties upon which Stroud himself avowedly relies. Therefore, Hegel's reaction to Stroud's skepticism would be the same. He would charge that it is not skeptical enough in two respects. First, it dogmatically presupposes as unquestionable the highly questionable picture of reality as neatly partitioned into subjective and objective dimensions, with mind on one side and world on another. Second, it uncritically assumes an unproblematic relationship between the experiencer and his/her experiences. Yet, how might a Stroudian push back against these Hegelian objections to Cartesian-style skepticism? And, does Hegel offer any additional considerations relevant to ancient, modern, and/or Stroudian skepticism?

There indeed is more Hegel has to say about various permutations of skepticism. To begin with, Hegel's Jena-period "Aphorisms from the Wastebook" (1803-1806) contain some remarks warranting attention in the present context. One aphorism has it that, "The questions which philosophy does not answer are answered in that they should not be so

75 Hegel 1970a, p. 72; Hegel 1977, p. 49

posed."[76] Soon after this observation, Hegel alleges that:

> Universal doubt is easily conceived and asserted, but the question is whether it is true. The empty word, unless the whole nature of things be denied, is a lie; and it is terrible what men want to deceive and persuade themselves and others of (*Zweifeln an allem ist leicht gedacht und gesagt, aber die Frage ist, ob es wahr ist? Das leere Wort, wenn nicht die ganze Natur des Wesens sich verleugnet, ist eine Lüge, und es ist entsetzlich, was die Menschen sich selbst und andere belügen und überreden wollen*).[77]

To these two aphorisms, taken together, should be added a subsequent observation made by Hegel in his Berlin *Lectures on the History of Philosophy*: Radical (modern) skepticism is, strictly speaking, irrefutable.[78] But, rather than being a virtue, irrefutability is a vice.

What all of the immediately preceding signifies is that, on Hegel's assessment, a Berkeley or a Stroud always effortlessly can "conceive and assert" an extreme, solipsism-style skepticism. A Berkeleyan can verbally conjure away any and every material real(ity) again and again. A Stroudian repeatedly can posit *ad nauseam* an unbridgeable chasm separating thinking from being, mind from world. However, as the saying goes, talk is cheap.

Following a procedure of prudent weighing-up of reasons for and against employed by, for instance, Hume himself in his assault on the very notion of religious miracles,[79] the Jena-era Hegel indicates that modern-skeptic verbiage (as "empty words"),[80] when set against the overwhelmingly massive body of evidence testifying against it (i.e., "the whole nature of things"), looks to be a nest of misleading falsehoods (i.e., "a lie"). What is more, this same Hegel subtly gestures at Descartes's "First Meditation," specifically, its famous skeptical scenario in which an all-powerful evil deceiver makes it such that even the most certain-seeming non-empirical, purely conceptual judgments (of an analytic and/or *apriori* sort), along the lines of "2 + 2 = 4," are really false. Hegel insinuates that the only evil deceivers to be worried about are those persons who seek to cast themselves and/or others into abysses of

76 Hegel 2002, p. 248

77 Hegel 1970b, pg. 549; Hegel 2002, pp. 248-249

78 Hegel 1955a, pp. 328-330

79 Hume 1993 pp. 77-79, 81, 87-88

80 Hegel 1977, pp. 50-52, 56

hyperbolic doubts ("it is terrible what men want to deceive and persuade themselves and others of").

Additionally, Hegel takes irrefutable insistences upon impossible-to-solve problems, such as modern skepticism's radical doubts trading upon an absolutized, uncrossable divide between subjectivity and objectivity, as symptomatic of barren cul-de-sacs arrived at via wrong turns, rather than philosophically productive and decisive conclusions. More precisely, Hegel sees skeptical scenarios such as Descartes's omnipotent malicious genius—he would perceive twentieth-century versions of this scenario (i.e., brains in vats or matrices) in the same way—as reductions-to-the-absurd of the one or more premises responsible for absolutizing modern variations of the distinction between, on one side, thinking-mind-subject and, on another side, being-world-object. If anything, Cartesian, empiricist, and Stroudian skepticisms are, in truth, red flags signaling that one has taken prior missteps somewhere along the way dead-ending in these bogs of uncertainties. It appears that what holds for the natural sciences, which take a dim view of the permanently irrefutable and the forever unsolvable, holds too for Hegelian philosophical *Wissenschaft*.

Elsewhere, I have reconstructed in detail Hegel's doctrine of modal categories.[81] On the basis of this reconstruction, I can state here that Hegel is adamant about distinguishing between, on the one hand, concretely potential possibilities arising from something already given and, on the other hand, the empty unreality of merely logical possibilities with no links to established actuality.[82] In relation to this distinction, Cartesian-style skeptical scenarios involving deceitful, manipulative demons, scientists, robots, or whatever else would amount to nothing more than the trivial products of playing with permutations of purely logical possibilities (what Robert Pippin, in *Hegel's Idealism: The Satisfactions of Self-Consciousness*, characterizes as "epistemically idle" doubts[83]). Within recent Analytic debates, Peacocke similarly resists the sorts of doubts exemplified by the hypothesis of a "permanently envatted brain."[84] He suggests that Stroudian-style skeptical objections to transcendental arguments can be sidelined by situating them on the former side of a distinction between metaphysical (i.e., merely logical)

81 Johnston 2018b

82 Hegel 1991, §143 pg. 216

83 Pippin 1989, pp. 98, 250

84 Peacocke 2009a, p. 760

possibilities and real (i.e., actually potential) possibilities.[85]

The entire preceding discussion of Hegel on skepticism pushed off from his 1802 essay "On the Relationship of Skepticism to Philosophy, Exposition of Its Different Modifications and Comparison of the Latest Form with the Ancient One." Prior to the 1807 *Phenomenology*, Hegel shares with many of his fellow German-speaking intellectuals a nostalgic, romanticizing view of ancient Greece. Accordingly, the early Hegel's attacks on Schulze and similar Cartesian- and empiricist-type skeptics tend to convey the impression that Hegel wholeheartedly embraces ancient skepticism and unreservedly repudiates modern skepticism.

However, starting in the *Phenomenology* (particularly its renowned interpretation of Sophocles's *Antigone*), Hegel breaks with romantic nostalgia for the supposed "paradise lost" of the Greek *polis* of antiquity. Relatedly, he sees history generally as a one-way street and the historical advent of modernity specifically as irreversible. Hence, the post-1807 Hegel, as regards skepticism, does not simply laud the ancient and condemn the modern sort. Indeed, the later Hegel, beginning in 1807, poses objections against the skepticism of antiquity. Correlatively but conversely, aspects of modern Cartesian and post-Cartesian skepticism, up to and including their integration into Kantian critical philosophy, play crucial roles in the methodology and metaphysics of the mature Hegelian System.

In Hegel's Berlin *Lectures on the History of Philosophy*, he criticizes ancient skepticism for its allegedly contingent deployment of dialectics.[86] On his assessment, skeptics like the Pyrrhonists and their ilk, in exercising their equipollence method, are doubly arbitrary. First, they are inclined to render dubitable only those particular claims they happen to come across as espoused by others (thereby also getting mired in the impossible-to-complete task of refuting the potentially infinite number of particular claims[87]). Second, they unsystematically select counter-claims to play off against the particular claims they encounter.

I might additionally mention that, from a Hegelian perspective, there is a dogmatic element to the equipollence skepticism of certain of the ancients. It arguably is a matter of dogmatic belief to be completely convinced that every thesis can and should be perfectly counterbalanced by a corresponding antithesis. Why would it be the case that a fifty-fifty equilibrium always holds between all given claims and their (however

85 Ibid., pp. 760-762, 766

86 Hegel 1955a, p. 331

87 Forster 1989, pp. 133-134

selected) specific counter-claims? What, if anything, licenses confidence in the assumed or purported universality and invariability of equipollence itself?

When Hegel depicts ancient skepticism in the *Phenomenology* as frenzied and self-devouring,[88] as bringing about the opposite of the *ataraxia* it desires, I suspect that what I have just said about dogmatism regarding equipollence is part of what he has in mind. This is because, if ancient skepticism is truly skeptical to the very end, becoming skeptical about the dogma of its own defining equipollence procedure,[89] then it becomes skeptical about its very skepticism. Incidentally, I here disagree with Forster, who contends that Hegel concurs with the ancient skeptics about the ubiquity of equipollent balance between all claims and counter-claims under the sun.[90] Forster's contention risks rendering the dialectically self-destructive character of the ancient skeptical figure/shape of consciousness in the *Phenomenology* unintelligible.

Hegel, beginning in the *Phenomenology*, portrays his own "skepticism" (i.e., Hegelian dialectics) as necessary, non-arbitrary, systematic, and methodical. When he refers to his philosophy as a thoroughgoing, self-completing skepticism,[91] he means precisely this. To be more exact, in his immanent critiques of phenomenological figures/shapes of consciousness and logical categories as self-dialecticizing *qua* auto-undermining, he seeks to demonstrate that these *Gestalten* and *Kategorien*, themselves the roots of all particular claims and counter-claims, internally spawn out of themselves doubts about themselves.

This self-portrayal by Hegel of his dialectics brings into play and depends upon another component of his critique of skepticism (in this case, of ancient and modern variants alike). What lends the subversive negativity of dialectics its necessity, non-arbitrariness, systematicity, and methodicalness is the fact that the self-dialecticizing *qua* auto-undermining phenomenological *Gestalten* and logical *Kategorien* flow into each other. In other words, when these figures/shapes and categories get negated by their immanently produced (self-)contradictions, it is not as though the resulting impasses between theses and antitheses bring the process to a halt at the sheer nothingness of utter nullity.

Instead, the auto-negation of a given *Gestalt* or *Kategorie* gives rise to a particular successor figure/shape or category overcoming the

88 Hegel 1977, p. 124-126; Hyppolite 1974, p. 188

89 Forster 1998, p. 129

90 Forster 1989, p. 133

91 Hegel 1977, p. 50-52, 56; Habermas 1971, p. 13; Forster 1998, p. 114

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self-contradiction(s) plaguing its immediate predecessor. In Hegel's eyes, both ancient and modern skepticisms limit dialectical phenomena to the sterile impasses of unproductive indeterminate negation whose indeterminacy is simple nothingness. By contrast, his dialectics essentially entail the generative processes of productive determinate negation whose determinacy is a specific result with a precise content responding to the contradictions giving rise to this very result.[92] Determinate negation is what enchains together the self-undermining series of *Gestalten* and *Kategorien* into the exhaustive organization of a "self-completing skepticism." Jean Hyppolite, Jürgen Habermas, and Westphal all appropriately highlight the importance of the Hegelian distinction between determinate and indeterminate negation for Hegel's treatments of skepticism.[93]

Anticipating my Hegel-inspired response to Strawson's transcendental-without-transcendental-idealism (as well as, relatedly, to Analytic epistemology in general) to be articulated in the next section, the Hegelian dialectic's replacement of indeterminate with determinate negation entails, against indeterminate negation, that contradiction does not neatly and cleanly separate the mind from the world by depositing the former in the void of total indeterminacy. Determinate negation implies that there is a sort of stickiness to the world, that the contradictory elements and their residues cling to the contradiction itself and its (speculative) sublation/resolution. Matters having to do with the (degrees of) separation (or lack thereof) between mind and world will be central to my staging of Hegel *contra* Strawson below.

I will bring this section's staging of Hegel *contra* Stroud to a close by reconsidering Hegel's positioning *vis-à-vis* both ancient and modern skepticism. Throughout much of the preceding, it likely has seemed as though Hegel is overwhelmingly positive about ancient skepticism and overwhelmingly negative about modern skepticism. For instance, Pippin indicates that Hegel is utterly uninterested in Cartesian-type doubts.[94]

Forster goes much further in this vein. He depicts Hegel as leaving modern skepticism to be thoroughly refuted by a philosophically superior ancient skepticism.[95] If this depiction is accurate, then, assuming Kant's transcendentalism to be motivated in part by the desire to lay to rest Humean doubts, Forster's Hegel would judge the Kantian transcendental

92 Hegel 1977, pp. 51, 56; Hegel 1955a, pp. 330-331

93 Hyppolite 1997, pp. 12, 79, 117-118, 186; Habermas 1971, p. 18; Westphal 1989, p.163

94 Pippin 1989, p. 95

95 Forster 1989, p. 103; Forster 1998, p. 5

to be superfluous for this purpose (since the already-accomplished labors of the ancient skeptics would by themselves suffice). What is more, Forster relies upon there being a continuity in Hegel's views about skepticism from 1802's "On the Relationship of Skepticism to Philosophy" onward. Starting in 1802, according to Forster, Hegel consistently lavishes attention on "philosophically compelling" ancient skepticism and proportionally neglects with disdain "philosophically worthless" modern skepticism.[96]

Yet, insistence upon Hegel's 1802 attitudes towards skepticism ancient and modern as decisive for his later, mature philosophy runs up against the fact of his shift of attitude with respect to the ancients occurring at the end of his time in Jena. As I noted a short while ago, the 1807 *Phenomenology*, with its famous philosophical reading of Sophocles's *Antigone*, announces Hegel's break with his surrounding intellectual culture's tendency to fetishize and idealize the ancients. The golden age was not so golden after all. Paradise had to be lost—and this because it always-already was lost, never actually having been the paradise existing solely in the backward-cast gaze of the nostalgic beholder.

Of course, Forster or someone else committed to similar interpretations of Hegel's rapport with skepticism could retort that the general de-romanticization of antiquity as a whole initiated within the pages of the *Phenomenology of Spirit* has no bearing upon the special status of ancient skepticism specifically within the Hegelian philosophical apparatus. Greek tragic theater and the dialectical practice of equipollence arguments, the former artistic and the latter philosophical, are, after all, two distinct (albeit closely related) cultural phenomena. But, I would counter that Hegel, at least in the works of his maturity, evinces his characteristic ambivalence toward both ancient and modern skepticism. Such ambivalence is almost a matter of principle given the nature of the Hegelian dialectic and its omnipresence affecting Hegel's interpretations and appropriations of each and every component of the history of philosophy.

Therefore, it is not the case that Hegel, at least from 1807 onward, is unambivalently approving of ancient skepticism and, with equal unambivalence, disapproving of modern skepticism. He raises serious critical objections against ancient skepticism. As I already signaled above, the critical lesson of the *Phenomenology*'s portrayal of the ancient-skeptical figure/shape of consciousness is that its equipollence procedures, while intentionally aiming at *ataraxia* via *epochē*,

96 Forster 1998, p. 128-129, 188-189

unintentionally bring about the opposite, namely, the infinite unrest and anguish of forever-multiplying doubts and uncertainties. This is because it fails to get at the categorial sources capable of generating indefinitely proliferating multitudes of particular claims and counter-claims.

Forster and Michael Inwood align the difference between the calm of *ataraxia* and the agitation of doubt with ancient and modern skepticisms respectively.[97] However, this alignment threatens to obscure Hegel's contention that ancient skepticism fuels an unsettling vortex of uncertainties at least as much as does modern skepticism. The ancient skeptic differs from the modern one in aiming to achieve the end of *ataraxia* through the means of equipollence-induced doubt, rather than doubt being the end. But, when all is said and done, antiquity's skepticism actually brings about—what any *Gestalt* of consciousness really accomplishes, instead of what it intends or imagines itself to accomplish, is what truly matters to Hegel—an amount of the anxiety of uncertainty comparable to that generated by modernity's skepticism.

Indeed, Hegel's rhetoric, especially in the *Phenomenology*, announces the avowed modernness of his self-completing skepticism, namely, his speculative dialectics. The art of "tarrying with the negative,"[98] of enduring the ceaseless agitation of kinetic negativity and the doubt and despair to which it gives rise,[99] bears little resemblance to the placid balance of *epochē*'s equipollence. As a famous passage in the *Phenomenology*'s justifiably celebrated preface has it:

> The True is... the Bacchanalian revel in which no member is not drunk; yet because each member collapses as soon as he drops out, the revel is just as much transparent and simple repose (*Das Wahre ist... der bacchantische Taumel, an dem kein Glied nicht trunken ist; und weil jedes, indem es sich absondert, ebenso unmittelbar [sich] auflöst, ist er ebenso die durchsichtige und einfache Ruhe*).[100]

It would be very difficult to find something further removed from *ataraxia* than "the Bacchanalian revel in which no member is not drunk." If the intoxicated perpetual motion of the Hegelian System (i.e., "the True" [*das Wahre*]) involves *ataraxia* (i.e., "transparent and simple repose" [*die durchsichtige und einfache Ruhe*]), it is a highly peculiar kind quite

97 Forster 1989, p. 187; Inwood 1992, p. 265

98 Hegel 1977, p. 19

99 Ibid., pp. 49, 130, 332

100 (Hegel 1970a, p. 46; Hegel 1977, p. 27

different from the ancient strain.

Hegel here indicates that his "*ataraxia*" amounts to a dialectical convergence of the opposites of repose (i.e., the cool serenity sought by ancient skepticism) and drunkenness (i.e., the reeling disorientation bound up with modern skepticism). Considering the preponderance of language associated with restlessness and negativity in Hegel's discourse, I would venture that the sublating coincidence of drunkenness and repose occurs under the heading of the former and not the latter. In other words, the distinction between repose and drunkenness is a distinction internal to drunkenness (rather than internal to repose). That is to say, within the Hegelian edifice, things are unevenly weighted in favor of modernity's agitation over antiquity's calm. The fact that Hegel first equates "the True" with "the Bacchanalian revel" (instead of with "transparent and simple repose") signals as much.

In the *Phenomenology* and thereafter, Hegel is a decidedly modern thinker. He no longer romanticizes the ancients, including the ancient skeptics. He explicitly criticizes ancient skepticism. Likewise, Hegel makes a philosophical virtue out of the agitation it unintentionally (and modern skepticism intentionally) secretes in place of *ataraxia*.

Furthermore, Hegel, *pace* Forster in particular, integrates aspects of modern skepticism (especially as featuring in the work of Descartes and Kant) into the very foundations of his philosophy *qua* encyclopedic, systematic *Wissenschaft* (something Hans Friedrich Fulda, among others, underscores[101]). Habermas is right to depict Hegel's mature thinking as involving a radicalization of modern skepticism[102] (rather than a substitution of ancient for modern skepticism). Moreover, I am sympathetic to Stephen Houlgate's situating of the all-important beginning of Hegel's System (i.e., the start of *Logik* as led into by *Phänomenologie*) in a specifically modern epistemological tradition running from the Cartesian sweeping away of all presuppositions via hyperbolic doubts to the anti-dogmatism of Kantian critical demands placed on all knowledge-claims.[103] Incidentally, Forster, despite my differences with him that I am emphasizing at this juncture, helpfully observes that Hegel (unlike Schelling) is deeply concerned with epistemology despite his undeserved reputation as a dogmatic metaphysician thumbing his nose at the sorts of epistemological concerns epitomized by Kantian critique. As Forster notes, Hegel's criticisms of Kant's epistemology are not to be taken as indicating a

101 Fulda 1965, p. 25-26

102 Habermas 1971, pp. 9, 13, 15

103 Houlgate 2006, pp. 26-28, 37, 158-159, 162-163

disregard for epistemology *überhaupt*.[104]

For Hegel, modern skepticism is an essential moment, although still only a moment, of properly scientific (*als wissenschaftliche*) philosophy. Despite this skepticism's severe flaws and shortcomings, it represents philosophical modernity's (attempted) liquidation of all dogmatism. Faced with the sorts of doubts mobilizing by the likes of Descartes and Stroud, and under the shadow of Kant's critical-epistemological strictures, the Hegelian System, in its thoroughgoing modernness, gets itself well and truly underway by radicalizing skepticism to such an extent that it sweeps away all conceivable worldviews with their assumptions (i.e., the figures/shapes of consciousness sublated in the *Phenomenology*) and starts instead with the minimal absolute necessity of an impossible-not-to-presuppose/posit initial condition (i.e., the *Ur*-category of mere, sheer indeterminate Being at the beginning of the *Logic*).

Hegel seeks a (late-)modern way beyond (early-)modern skepticism (such as its Cartesian and Humean variants redeployed by Stroud). This way involves a new post-Kantian, dialectical-speculative logic as a transcendental without the subjectivist anti-realism of transcendental idealism. As will be seen momentarily in the following section, Hegel's realist (meta-)transcendentalism, although foreshadowing Strawson,[105] problematizes and critically supplements the Analytic epistemological milieu to which Strawson belongs.

§4 *Not Transcendental Enough: Too Smart to Ask Stupid Questions*

As I have suggested at earlier points above, Analytic philosophical debates about transcendental arguments, debates tied to the names "Strawson" and "Stroud," largely replay the tensions between Kant and certain of his early-modern predecessors (particularly Hume). Strawson defends Kantian transcendentalism (albeit without transcendental idealism) and Stroud advocates Humean (and, behind it, Cartesian) skepticism. In relation to the histories of both modern and Analytic philosophy, Pippin and Westphal each maintain that Hegel adopts a transcendental approach to rebutting early-modern forms of skepticism.[106] In an endnote, Pippin explicitly refers to Stroud as repeating Schulze's

104 Forster 1989, pp. 101-102, 111

105 Stekeler-Weithofer 1992, p. 25)

106 Pippin 1989, pp. 94-97, 99; Westphal 2003, p. 57

neo-Humean critique of Kant,[107] thereby indirectly hinting at a possible affinity between Hegelian and Strawsonian positions.
I very much agree with Pippin and Westphal that Hegel intends to preserve aspects of Kant's transcendental and redeploys it, both implicitly and explicitly, against modern skepticisms especially. But, like Westphal,[108] I disagree with Pippin about just how Kantian (or not) Hegel remains in his redeployment of transcendentalism (a disagreement I spell out in detail elsewhere[109]). By contrast with Pippin's Kantianizing deflationary interpretation of Hegel, I stress the significant differences between, on the one hand, Kant's transcendental idealism in its anti-realist subjectivism and, on the other hand, Hegel's absolute idealism in its realist anti-subjectivism. Most importantly, the categories of Hegelian *Logik* are, in relation to the natural and cultural Reals of *Realphilosophie*, ontological as well as epistemological possibility conditions, being objectively real in addition to, as with Kant's categories and the like, subjectively ideal.[110] Additionally, Hegel's System is put forward as truly beginning without presuppositions and with the logical category of indeterminate Being—a (transcendental) category no skeptic, no matter how radical, can doubt, deny, avoid, etc. as necessary to both thinking and being.

With Strawson and against Pippin, Hegel severs the link between the transcendental and idealism. I will not rehearse on this occasion Hegel's complex critique of Kant or, reflecting this, my critique of Pippin. For now, suffice it to say that the many-pronged Hegelian attack on Kant's theoretical philosophy—I particularly have in mind Hegel's objections to the interrelated Kantian notions of the thing-in-itself, the noumenal-phenomenal distinction, and the limits of possible experience—contains additional lines of response to early-modern/Stroudian skepticism complementing the rebuttals I already sketched in the prior section of this intervention. Countless others, as well as me,[111] have covered these facets of the multifaceted Kant-Hegel rapport.

At this juncture, I want to return to Schulze, the neo-Humean skeptic whose doubts about Kantian transcendentalism in his 1792 *Aenesidemus* prompt the young Hegel to pen his 1802 essay "On the Relationship of Skepticism to Philosophy, Exposition of Its Different

107 Pippin 1989, p. 279

108 Westphal 1993, pp. 263-272

109 Johnston 2018b,

110 Ibid.; Johnston 2013b

111 Johnston 2018b

Modifications and Comparison of the Latest Form with the Ancient One." Prior to 1802, Schulze's text influenced the development of post-Kantian German idealism almost as soon as it appeared. The early Fichte already was affected by the critiques of K.L. Reinhold as well as Kant in the *Aenesidemus*. In particular, Fichte's own early efforts took to heart Schulze's skeptical assaults undermining the soundness of Reinhold's *Grundsatz* (i.e., his elementary "first principle" functioning like Descartes's axiomatic "*Cogito, ergo sum*" in an attempt at a deductive, systematized reconstruction of Kant's theoretical philosophy). Schulze inspires Fichte, as reflected in the latter's review of *Aenesidemus*, to try to get back behind Reinhold's *Grundsatz* so as to identify an even more fundamental, indubitable first principle on the basis of which to ground and derive critical transcendental idealism.[112] This leads straight into the canonical first version (1794) of Fichte's *Wissenschaftslehre*.

To cut a long story short, Fichte's own *Grundsatz*, replacing that of Reinhold's "Principle of Consciousness" in response to Schulze's skeptical criticisms of Reinhold, itself relies upon appeal to the epistemological power of intellectual intuition. For both Kant and Hegel, such a power is to be shunned as epistemologically suspect. Schulze specifically inspires Fichte to double-down on the Reinholdian strategy of intellectual-intuition-driven deduction from a first principle. By contrast, modern skepticism generally, of which Schulze is merely the "latest" representative—by Hegel's lights, this orientation includes the Descartes of the "First Meditation," the British empiricists, and aspects of Kant's theoretical philosophy—helps inspire Hegel to replace intellectual intuition with dialectics as a means of moving beyond the confines of Kantian (and Fichtean) subjectivism while simultaneously respecting the epistemological constraints of Kantian critique (including its prohibition of recourse to intellectual intuition).[113]

Yet, in addition to this well-known story of Schulze's impact on the initial phases of post-Kantian idealism in the 1790s, there is another, less appreciated feature of *Aenesidemus* that, I believe, prefigures the later stages of German idealism as represented mainly by Schelling and Hegel. This feature will bring me back to considering the implications of Hegelianism for the Strawsonian position in Analytic controversies regarding transcendentalism. Schulze makes a demand of Kant's *Critique of Pure Reason*, albeit one he is skeptical can ever be met, that transcendental philosophy provide an account of the very genesis

112 Fichte 1988, p. 77

113 Schulze 1991, p. 17

(*Entstehung*) of its cognizing subjectivity.[114]

This Schulzean stress on the genetic simply gets folded by Fichte into the formal, logical movement of deduction. But, Schulze's *Entstehung* arguably reappears in more temporal and historical guises both in Hölderlin's 1795 "On Judgment and Being" and in Schelling's and Hegel's Hölderlin-inspired philosophical programs starting in 1796 (with the above-mentioned "Earliest System-Program of German Idealism"). I hypothesize this even though Schelling's and Hegel's writings leave it unclear how (un)aware they were of their debts to this aspect of *Aenesidemus*. Relatedly, Forster, in his *Hegel and Skepticism*, refers to "*Über Urtheil und Seyn*" and contends that Hegel's dialectical and historical extrapolations from Hölderlin's fragment are more philosophically satisfying than Schelling's epistemologically cavalier flights of intuitive fancy. But, Forster, at odds with Hegel's 1807 rupture with romanticizations of ancient Greece, here misattributes to Hegel a steadfast view of the Greek *polis* of antiquity as having been an original harmonious One or Whole (akin to Hölderlin's Being) divided and broken exclusively in and through subsequent historical developments.[115]

Schelling and Hegel, starting in the mid-1790s, both set themselves philosophical agendas, ones they remain faithful to for the rest of their lives, that centrally involve rising to the challenge Schulze, doubting it ever can be overcome, raises against the Kantian legacy (just as Fichte, Schelling, and Hegel all strive to defy Jacobi's anti-Kantian contention according to which a philosophy cannot simultaneously be rigorously systematic and affirming of human freedom). Insofar as the Schellingian and Hegelian permutations of this project are partly conducted at more-than-empirical levels, they fairly can be portrayed as genetic meta-transcendental supplements to the static transcendental of Kant's critical philosophy. Schelling delineates the relevant genetic processes in the terms of *Naturphilosophie* and/or theosophy. Hegel elaborates such pathways for the emergence of (transcendental) subject out of (meta-transcendental) substance in relation to both *Natur und Geist*.

But, before I go any further along these lines, what relevance does the preceding have for Analytic epistemology in general and Strawson in particular? There are two interlinked consequences crucial for my purposes. First, Strawson's de-idealized, realist transcendental neglects the genetic problematic arising in the immediate Kantian aftermath with Schulze, Hölderlin, Schelling, and Hegel. Second, the entire twentieth-century array of Anglo-American approaches to knowledge within which

114 Ibid., pp. 43, 127

115 Forster 1989, pp. 48-50, 53-54

Strawson is situated, minus such a genetic dimension, take for granted that there is something self-sufficient and rock-bottom about knowledge itself as a problem. They fail to inquire about how it is that knowing comes to be a fundamental difficulty in the first place. What do I mean by this?

If one does not accept the notion that transcendental subjectivity *à la* transcendental idealism always-already exists as an eternal formal reality, then one is under the obligation to ask and answer questions about its preconditions and emergence. Similarly, if one is committed to any non-dualist, anti-subjective form of immanentism/monism also rejecting metaphysical realism—I consider this to include any authentic version of materialism and/or naturalism—then there is an ontological enigma to be confronted prior to the epistemological puzzle of if or how mind comes to know world. Assuming, in line with a genetic non-subjectivism, thinking to arise from being, subjects to surface out of substances, what makes possible the very coming into existence of a separation between subjectivity and substantiality/objectivity such that spanning this divide becomes a problem, namely, the problem of epistemology as such?

Philosophically prior to a modern epistemology hosting disputes between transcendentalists and skeptics, there must be an ontology delineating the possibility conditions for this very epistemology *tout court*. With the adjective "transcendental" traditionally designating epistemological conditions of possibility, these ontological conditions of possibility would have to be qualified as meta-transcendental. Insofar as modern epistemology is predicated upon there being a mind-world, subject-object gulf to span if knowledge is to be attained, this field of problems is itself made possible by the real genesis of this gulf itself. Cassam, one of the leading participants in contemporary Analytic discussions concerning the transcendental, observes:

> An epistemological how-possible question asks how knowledge of some specific kind is possible. Such questions are obstacle-dependent since they are motivated by the thought that there are actual or apparent obstacles to the existence of whatever kind of knowledge is in question.[116]

What Cassam has to say here about particular instances of specific "how-possible" questions in epistemology also holds for the question of how epistemology itself is possible in the first place. How

116 Cassam 2007, p. 51

are these epistemological how-possible questions themselves possible? To the extent that epistemology depends upon the "obstacle" of the division between thinking and being or subjectivity and objectivity, the ontological question of how this obstacle itself is possible enjoys a certain philosophical priority. In short, the ontology of anthropogenesis (both phylogenetic and ontogenetic) comes before and paves the way for epistemology. Prior to a transcendental theory of knowledge as the overcoming of the subject-object gap, there has to be a meta-transcendental theory of being as generating this very gap within itself.

Pace most partisans of epistemology as first philosophy, the fundamental miracle to be explained is not the arrival at some correspondence-version of knowledge (whether characterized as "justified true belief" or otherwise). The real mystery is not that subject can (re)connect with substance, but that subject separated off from substance to begin with—thus creating the very obstacle of separation making possible knowledge as the overcoming of this same separation. A Hegel-inspired meta-transcendental, genetic-diachronic "error-first ontology" (EFO) is a necessary accompaniment to any transcendental, static-synchronic epistemology (whether that of Kant, Strawson, or whoever else) obsessed with verifying the credentials of true knowledge.

With the phrase "error-first," I have in mind the amazing fact that there come to be beings (i.e., human beings) who could be said somehow or other to fall out of being itself, becoming disconnected from or untethered to what is such that these peculiar beings can and do wander about in dreams, fantasies, fictions, hallucinations, illusions, and the like. For any immanentist/monist of a materialist/naturalist type, this is (or should be) the most incredible thing of all. What is more, there admittedly is a cross-resonance between my use of the word "error" here and what Heidegger means when he speaks of ontological (not just ontic) "errancy" (*die Irre*). In Heidegger's essay "On the Essence of Truth," he states:

> Man errs (*Der Mensch irrt*). Man does not merely stray into errancy (*Der Mensch geht nicht erst in die Irre*). He is always astray in errancy, because as ek-sistent he in-sists and so already is caught in errancy. The errancy through which man strays is not something which, as it were, extends alongside man like a ditch into which he occasionally stumbles; rather, errancy belongs to the inner constitution of the Da-sein (*inneren Verfassung des Da-seins*) into which historical man is admitted.[117]

117 Heidegger 1967, p. 92; Heidegger 1993, p. 133

On combined Hegelian and dialectical materialist grounds, I eschew the notion of ontological difference to which Heidegger ties this thesis about *Dasein*'s essential errancy—with erring, for him, amounting to an inherent tendency towards preoccupation with ontic beings at the expense of ontological Being. That said, the "error" of which I speak apropos "error-first ontology" is, like Heidegger's inherent *Irre*, not one or more isolated falsities or mistakes but, instead, part of the basic structure or nature of human being.

Before pivoting from Heidegger to Deleuze in following the thread of EFO, *Being and Time* contains a reference to a noteworthy passage in the *Critique of Pure Reason*. In the preface to the B-edition, Kant comments regarding his "new refutation of psychological idealism":

> No matter how innocent idealism may be held to be as regards the essential ends of metaphysics (though in fact it is not so innocent), it always remains a scandal of philosophy and universal human reason that the existence of things outside us (*das Dasein der Dinge außer uns*) (from which we after all get the whole matter of our cognitions, even for our inner sense) should have to be assumed merely on faith (*Glauben*), and that if it occurs to anyone to doubt it, we should be unable to answer him with a satisfactory proof.[118]

In 1785, two years prior to the B-edition of the first *Critique*, Jacobi invokes belief/faith (*Glaube*) as the sole basis for affirming "the existence of things outside us."[119] In 1787, the same year as the second edition of Kant's crowning theoretical achievement, Jacobi indeed maintains in print that, "my conviction (*Überzeugung*) about the existence of real things outside me (*wirkliche Dinge außer mir*) is only a matter of *faith* (Glaube)" and that, "as a realist I am forced to say that all knowledge derives exclusively from faith (*aus dem Glaube komme*)."[120]

From Jacobi's perspective, Kant is responsible for scandalizing himself, since his idealist-*qua*-anti-realist "denying of knowledge to make room for faith"[121] places the being of things-in-themselves (i.e., "*das Dasein der Dinge außer uns*") outside the limits of the knowable. Jacobi advocates the "*salto mortale*"[122] of belief/faith as the lone realist way

118 Kant 1968, Bxxxix pg. 38; Kant 1998, Bxxxix pg. 121

119 Jacobi 1994, p. 234

120 Jacobi 1994, p. 256

121 Kant 1998, Bxxx pg. 117

122 Jacobi 1994, p. 189

beyond the conflict between idealism (including Kant's transcendental sort) and (modern) skepticism (whether Cartesian, Lockean, Berkeleyan, or Humean). As would a Stroudian, a Jacobian finds Kant's ostensible "proof of realism" via his 1787 "new refutation of psychological idealism" (attempting to fend off impressions of the first, 1781 edition as rehashing Berkeley's Descartes-indebted [psychological] idealism) unconvincing given its containment within the parameters of subjectivist, anti-realist transcendental idealism. Whatever it proves about objects (*als Objekte oder Gegenstande*) of outer sense, these objects and this sense still are, as per transcendental idealism, "in us" on this side of the limits of possible experience—and, hence, different-in-kind from "the existence of things outside us (*das Dasein der Dinge außer uns*)" in any realist sense. Of course, even for Kant himself as a transcendental idealist, objects (*Objekte*|*Gegenstande*) are not things (*Dinge*).

The Kant-Jacobi connection noted, Heidegger, apropos the above-quoted passage from the first *Critique*, succinctly remarks that, "The 'scandal of philosophy' is not that this proof has yet to be given, but that *such proofs are expected and attempted again and again*."[123] Rosen cites this Heideggerian remark while calling into question the Analytic tying of the transcendental to arguments against veil-of-perception skepticism. I mention Rosen's maneuvers near the end of the second part of my text above.

Departing from a combination of *Being and Time* with "On the Essence of Truth," I would say that Kant's epistemological scandal is not the primary or real scandal. The ultimate scandal is the ontological one of philosophy still awaiting an account of *Ur*-errancy as such (or, in a Heideggerian-style complementary inversion, of the erring of the *Ur*). It is yet even more scandalizing that this ontological scandal continues to remain eclipsed by epistemological scandals, with the latter as (unacknowledged) secondary effects of the former. If consequently followed out to the roots of the matter, thinking the unthought of epistemology, as Heidegger would phrase it, ultimately leads to an ontology of errancy. This *Irre* makes possible knowledge in general, knowledge as a problem, and specific problems of knowledge.

I come now to Deleuze before concluding my intervention. Despite Heidegger's ambivalence and Deleuze's hostility towards Hegel's philosophy, both thinkers have moments that permit me to situate them in a subterranean lineage of EFO that starts with Hegel. That said, *Difference and Repetition* contains a fascinating stretch of just a few

123 Heidegger 1962, p. 249

pages on the subject of "stupidity" (*bêtise*).[124]

As with Heidegger's ontological errancy irreducible to mere ontic misjudgments, Deleuze's "transcendental stupidity" is not to be equated with straightforward empirical errors as per a correspondence theory of truth. As Deleuze rightly observes, "the image of thought" tacitly but powerfully holding sway over philosophy screens out in advance taking seriously anything associated with stupidity. Is not philosophy, the "love of wisdom," about smartly pondering truth, knowledge, and intelligence, rather than falsity, ignorance, and imbecility? From the perspective of *Difference and Repetition*, philosophers here risk being, as the saying goes, too smart for their own good. They cannot really get to grips with truth, knowledge, and intelligence without confronting a more-than-empirical stupidity that itself is not the diametrical opposite of smartness. Instead, this *bêtise*, with its un-attuned dampening of and wandering from the Real, is a precondition for the artful abstractions of the keen, discerning mind.

For Deleuze in 1968, there is "a properly transcendental question: how is stupidity (not error) possible?"[125] On this precise Deleuzian point, I wholeheartedly concur as to the significance of this question. And, EFO not only elevates this question to the status of the meta-transcendental—it also goes on to posit such non-empirical *bêtise* as the possibility condition for everything that is not (so) stupid in thinking, including what human beings count as successful (or, at least, good enough) cases of truly knowing.

Yet, *contra* the Spinoza so dear to Deleuze, EFO, in line with Hegel's Spinoza critique,[126] entails an inversion of Spinoza's famous "truth reveals both itself and the false."[127] For EFO, falsity is the index of itself and the true. Put with greater exactitude, the true knowledge of epistemology, as by its very nature dependent upon ignorance insofar as it is a surpassing of barriers to knowing, comes after and is secondary to the false non-knowledge of error *à la* Heideggerian ontological errancy or Deleuzian transcendental stupidity.

I would like to conclude by invoking Freud and Lacan, taking psychoanalysis as another major ally of EFO. According to Freudian metapsychology, the psyche ontogenetically begins, like Descartes-the-meditative-dreamer, in hallucinations and lies, namely, recoilings

124 Deleuze 1968, pp. 194-198; Deleuze1994, pp. 149-153

125 Deleuze 1994, p. 151

126 Johnston 2014, pp. 13-107

127 Spinoza 2002, p. 949

and deviations from what merely is. Humans become what they are in and through the mysterious miracle of separation and withdrawal, through embodying, as Lacan might baptize it, a "passion for ignorance." According to an error-first ontology of anthropogenesis inspired by psychoanalysis as well as Hegelianism, there is something still more truthful to be extracted from the cliché "to err is human." Specifically, no proper subject even emerges at all without there being the *proton pseudos* of the (meta-)transcendental errancy of and from substance. But, against the cliché, there is not first the human and then the erring. There simply is no human, and no peculiarly human problems such as epistemology, without the erring.

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Bibliography

Badiou, Alain 1999, "The (Re)turn of Philosophy Itself," *Manifesto for Philosophy* [trans. Norman Madarasz], Albany: State University of New York Press

— 2005, *Being and Event* [trans. Oliver Feltham], London: Continuum

— 2006, *Briefings on Existence: A Short Treatise on Transitory Ontology* [trans. Norman Madarasz], Albany: State University of New York Press,

— 2009b, *Logics of Worlds: Being and Event, 2* [trans. Alberto Toscano], London: Continuum

— 2009a, *Theory of the Subject* [trans. Bruno Bosteels], London: Continuum

Beiser, Frederick 2005, *Hegel*, New York: Routledge

Bell, David 1999, "Transcendental Arguments and Non-Naturalistic Anti-Realism," *Transcendental Arguments: Problems and Prospects* [ed. Robert Stern], Oxford: Oxford University Press

Bienenstock, Myriam 1992, *Politique du jeune Hegel: Iéna 1801-1806*, Paris: Presses Universitaires de France

Bonsiepen, Wolfgang 1997, *Die Begründung einer Naturphilosophie bei Kant, Schelling, Fries und Hegel*, Frankfurt am Main: Vittorio Klostermann

Bourgeois, Bernard 2000, *Hegel à Francfort ou Judaïsme-Christianisme-Hegelianisme*, Paris: Vrin

Bowman, Brady 2013, *Hegel and the Metaphysics of Absolute Negativity*, Cambridge: Cambridge University Press

Cassam, Quassim 1987, "Transcendental Arguments, Transcendental Synthesis and Transcendental Idealism," *The Philosophical Quarterly*, vol. 37, no. 149

— 1999, "Self-Directed Transcendental Arguments," *Transcendental Arguments: Problems and Prospects* [ed. Robert Stern], Oxford: Oxford University Press, 1999

— 2007, *The Possibility of Knowledge*, Oxford: Oxford University Press

Deleuze, Gilles 1968, *Différence et répétition*, Paris: Presses Universitaires de France

— 1977, "I have nothing to admit" [trans. Janis Forman], *Semiotext(e)* 2, no. 3

— 1994, *Difference and Repetition* [trans. Paul Patton], New York: Columbia University Press

— 1995, "Letter to a Harsh Critic," *Negotiations: 1972-1990* [trans. Martin Joughin], New York: Columbia University Press

Düsing, Klaus 1976, *Das Problem der Subjektivität in Hegels Logik*, *Hegel-Studien*, *Beiheft 15*, Bonn: Bouvier

Elder, Crawford 1980, *Appropriating Hegel*, Aberdeen: Aberdeen University Press

Fichte, J.G. 1988, "Review of *Aenesidemus*," *Fichte: Early Philosophical Writings* [ed. and trans. Daniel Breazeale], Ithaca: Cornell University Press

Forster, Michael N. 1989, *Hegel and Skepticism*, Cambridge: Harvard University Press

— 1998, *Hegel's Idea of a Phenomenology of Spirit*, Chicago: The University of Chicago Press

Franks, Paul W. 2005, *All or Nothing: Systematicity, Transcendental Arguments, and Skepticism in German Idealism*, Cambridge: Harvard University Press

Fulda, Hans Friedrich 1965, *Das Problem einer Einleitung in Hegels Wissenschaft der Logik*, Frankfurt am Main: Vittorio Klostermann

Habermas, Jürgen 1971, *Knowledge and Human Interests* [trans. Jeremy J. Shapiro], Boston: Beacon Press

Harris, H.S. 1972, *Hegel's Development I: Toward the Sunlight, 1770-1801*, Oxford: Oxford University Press

— 1997, *Hegel's Ladder I: The Pilgrimage of Reason*, Indianapolis: Hackett

Harrison, Ross 1982, "Transcendental Arguments and Idealism," *Idealism Past and Present* [ed. G. Vesey], Cambridge: Cambridge University Press

Hegel, G.W.F. 1955a, *Lectures on the History of Philosophy, Volume Two* [trans. E.S. Haldane and Frances H. Simson], New York: The Humanities Press

— 1955b, *Lectures on the History of Philosophy, Volume Three* [trans. E.S. Haldane and Frances H. Simson], New York: The Humanities Press

— 1969, *Science of Logic* [trans. A.V. Miller], London: George Allen & Unwin

— 1970a *Phänomenologie des Geistes*, *Werke in zwanzig Bänden, 3* [ed. Eva Moldenhauer and Karl Markus Michel], Frankfurt am Main: Suhrkamp

— 1970b, "*Aphorismen aus Hegels Wastebook (1803-1806)*," *Werke in zwanzig Bänden, 2: Jenaer Schriften, 1801-1807*, [ed. Eva Moldenhauer and Karl Markus Michel], Frankfurt am Main: Suhrkamp

— 1971, *Philosophy of Mind: Part Three of the Encyclopedia of the Philosophical Sciences with the Zusätze* [trans. William Wallace and A.V. Miller], Oxford: Oxford University Press

— 1977, *Phenomenology of Spirit* [trans. A.V. Miller], Oxford: Oxford University Press

— 1984 "Hegel to Niethammer: Nuremberg, October 23, 1812," *Hegel: The Letters* [trans. Clark Butler and Christiane Seiler], Bloomington: Indiana University Press

— 1991, *The Encyclopedia Logic: Part I of the Encyclopedia of the Philosophical Sciences with the Zusätze* [trans. T.F. Geraets, W.A. Suchting, and H.S. Harris], Indianapolis: Hackett

— 2000, "On the Relationship of Skepticism to Philosophy, Exposition of its Different Modifications and Comparison of the Latest Form with the Ancient One" [trans. H.S. Harris], *Between Kant and Hegel: Texts in the Development of Post-Kantian Idealism* [ed. and trans. George Di Giovanni and H.S. Harris], Indianapolis: Hacket

— 2002, "The Earliest System-Program of German Idealism" [trans. H.S. Harris], *Miscellaneous Writings of G.W.F. Hegel* [ed. Jon Stewart], Evanston: Northwestern University Press

— 2002, "Aphorisms from the Wastebook" [trans. Susanne Klein, David L. Roochnik, and George Elliot Tucker], *Miscellaneous Writings of G.W.F. Hegel* [ed. Jon Stewart], Evanston: Northwestern University Press

— 2008, *Lectures on Logic: Berlin, 1831* [trans. Clark Butler], Bloomington: Indiana University Press,

Heidegger, Martin 1962, *Being and Time* [trans. John Macquarrie and Edward Robinson], New York: Harper & Row

— 1967, "*Vom Wesen der Wahrheit*," *Wegmarken*, Frankfurt am Main: Vittorio Klostermann

— 1993, "On the Essence of Truth" [trans. John Sallis], *Basic Writings* [ed. David Farrell Krell], New York: HarperCollins, (second edition

Henrich, Dieter 1982, "*Kant und Hegel: Versuch der Vereinigung inhrer Grundgedanken*," *Selbstverhältnisse: Gedanken und Auslegungen zu den Grundlagen der klassischen deutschen Philosophie*, Stuttgart: Reclam,

Houlgate, Stephen 2006, *The Opening of Hegel's Logic: From Being to Infinity*, West Lafayette: Purdue University Press

Hume, David 1993, *An Enquiry Concerning Human Understanding* [ed. Eric Steinberg], Indianapolis: Hackett, (second edition)

Hyppolite, Jean 1974, *Genesis and Structure of Hegel's Phenomenology of Spirit* [trans. Samuel Cherniak and John Heckman], Evanston: Northwestern University Press, 1974

— 1997, *Logic and Existence* [trans. Leonard Lawlor and Amit Sen], Albany: State University of New York Press

Inwood, Michael 1992, *A Hegel Dictionary*, Oxford: Blackwell

Jacobi, F.H. 1994, "Concerning the Doctrine of Spinoza in Letters to Herr Moses Mendelssohn," *The Main Philosophical Writings and the Novel Allwill* [trans. George di Giovanni], Montreal and Kingston: McGill-Queen's University Press

— 1994, "David Hume on Faith, or Idealism and Realism: A Dialogue," *The Main Philosophical Writings and the Novel Allwill* [trans. George di Giovanni], Montreal and Kingston: McGill-Queen's University Press

Johnston, Adrian 2013a, "An Interview with Adrian Johnston on Transcendental Materialism [with Peter Gratton]," *Society and Space*, http://societyandspace.com/2013/10/07/interview-with-adrian-johnston-on-transcendental-materialism/

— 2013b, *Prolegomena to Any Future Materialism, Volume One: The Outcome of Contemporary French Philosophy*, Evanston: Northwestern University Press

—2014, *Adventures in Transcendental Materialism: Dialogues with Contemporary Thinkers*, Edinburgh: Edinburgh University Press

—2017, "Transcendental Materialism: A Conversation with Adrian Johnston [with Anthony Morgan]," *The Kantian Catastrophe?: Conversations on Finitude and the Limits of Philosophy* [ed. Anthony Morgan], Newcastle-upon-Tyne: Bigg Books

— 2018a, "On Transcendental Materialism: An Interview with Adrian Johnston," *Ex Nihilo*, 2018 (forthcoming)

— 2018b, *A New German Idealism: Hegel, Žižek, and Dialectical Materialism*, New York: Columbia University Press, 2018 (forthcoming)

— 2018c, *Prolegomena to Any Future Materialism, Volume Two: A Weak Nature Alone*, Evanston: Northwestern University Press, 2018 (under review)

— 2018d, "Meta-Transcendentalism and Error-First Ontology: The Cases of Gilbert Simondon and Catherine Malabou," *Rethinking the Milestones: Studies in Contemporary Realism* [ed. Gregor Kroupa and Jure Simoniti], London: Bloomsbury, 2018 (forthcoming)

Kant, Immanuel 1968, *Kritik der reinen Vernunft, 1, Werkausgabe, Band III* [ed. Wilhelm

Weischedel], Frankfurt am Main: Suhrkamp
— 1998, *Critique of Pure Reason* [trans. Paul Guyer and Allen Wood], Cambridge: Cambridge University Press
Kimmerle, Heinz 1970, *Das Problem der Abgeschlossenheit des Denkens: Hegels "System der Philosophie", in den Jahren 1800-1804*, *Hegel-Studien*, *Beiheft 8*, Bonn: Bouvier
Kreis, Guido 2015, *Negative Dialektik des Unendlichen: Kant, Hegel, Cantor*, Berlin: Suhrkamp
Meillassoux, Quentin 2008, *After Finitude: An Essay on the Necessity of Contingency* [trans. Ray Brassier], London: Continuum
Patzig, Günther 1979, "Comment on Bennett," *Transcendental Arguments and Science: Essays in Epistemology* [ed. Peter Bieri, Rolf-P. Horstmann, and Lorenz Krüger], Dordrecht: D. Reidel
Peacocke, Christopher 2009a, "Objectivity," *Mind*, vol. 118, no. 471
— 2009b, "Means and Explanation in Epistemology," *The Philosophical Quarterly*, vol. 59, no. 237
Pippin, Robert B. 1989, *Hegel's Idealism: The Satisfactions of Self-Consciousness*, Cambridge: Cambridge University Press
Pöggeler, Otto 1984, "*Hegel, der Verfasser des ältesten Systemprogramms des deutschen Idealismus*," *Mythologie der Vernunft: Hegels »ältestes Systemprogramm« des deutschen Idealismus* [ed. Christoph Jamme and Helmut Schneider], Frankfurt am Main: Suhrkamp
Rosen, Michael 1999, "From Kant to Fichte: A Reply to Franks," *Transcendental Arguments: Problems and Prospects* [ed. Robert Stern], Oxford: Oxford University Press
Schulze, G.E. 1911, *Aenesidemus oder über die Fundamente der von dem Herrn Professor Reinhold in Jena gelieferten Elementar-Philosophie—Nebst einer Vertheidigung des Skepticismus gegen die Anmaassungen der Vernunftkritik*, Berlin: Reuther and Reichard
Shoemaker, Sydney 1963, *Self-Knowledge and Self-Identity*, Ithaca: Cornell University Press
Spinoza, Baruch 2002, "Letter 76: Greetings to the noble young man, Alfred Burgh, from B.d.S., December 1675," *Spinoza: Complete Works* [ed. Michael L. Morgan; trans. Samuel Shirley], Indianapolis: Hackett
Stekeler-Weithofer, Pirmin 1992, *Hegels Analytische Philosophie: Die Wissenschaft der Logik als kritische Theorie der Bedeutung*, Paderborn: Ferdinand Schöningh
Strawson, P.F. 1964, *Individuals: An Essay in Descriptive Metaphysics*, London: Methuen
— 1966, *The Bounds of Sense: An Essay on Kant's Critique of Pure Reason*, London: Methuen
Stroud, Barry 1968, "Transcendental Arguments," *The Journal of Philosophy*, vol. 65, no. 9, May 2
— 1979, "The Significance of Scepticism," *Transcendental Arguments and Science: Essays in Epistemology* [ed. Peter Bieri, Rolf-P. Horstmann, and Lorenz Krüger], Dordrecht: D. Reidel
Vaysse, Jean-Marie 1994, *Totalité et subjectivité: Spinoza dans l'idéalisme allemande*, Paris: Vrin
Vogel, Jonathan 1999, "Causation and Subjectivity," *Transcendental Arguments: Problems and Prospects* [ed. Robert Stern], Oxford: Oxford University Press
Westphal, Kenneth R. 1989, *Hegel's Epistemological Realism: A Study of the Aim and Method of Hegel's Phenomenology of Spirit*, Dordrecht: Kluwer
— 1993, "Hegel, Idealism, and Robert Pippin," *International Philosophical Quarterly*, no. 33, 1993
— 2003, *Hegel's Epistemology: A Philosophical Introduction to the Phenomenology of Spirit*, Indianapolis: Hackett
Žižek, Slavoj 2014, *Absolute Recoil: Towards a New Foundation of Dialectical Materialism*, London: Verso

The System that Destroys Itself, or Greenberg's Modernism & the Liar's Paradox

Juliette Kennedy & Michael Maizels

Abstract: This paper reconsiders the unraveling of modernism in the visual arts in the middle 1960s. Building on Craig Owens' observation that "eruption of language" in the visual arts signaled "the emergence of postmodernism," we here argue that the linguistic-based projects of John Baldesarri, Dan Graham and others catalyzed the rupturing of modernist aspirations to autonomy and completeness by creating the possibilities of pernicious self-reference. This argument draws from a remarkable set of parallelism from the distal domain of mathematics, in which the "modernist" aspirations to purity and self-sufficiency were similarly disrupted by the introduction of seemingly paradoxical self-referential statements, most notably Gödelian incompleteness. This is not to suggest that Baldessari *et al.* were influenced by Gödel, but rather to argue that, as in the case of Gödel's theorems, the work of these artists constitutes a clear response to a property of systematicity itself, namely that increasing denotative power can lead to the collapse of the system.

Keywords: modernism, postmodernism, Greenberg, Godel, incompleteness, art, mathematics

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"Could anyone ten years ago," asked the artist and critic Mel Bochner in 1971, "have imagined that 'modern art' would become a period style?"[1] Nearly five decades after the posing of this rhetorical question, Bochner's incredulity seems to spur an incredulity of its own. The now sprawling directions of contemporary artistic practice are driven by the rapid coalescing and dissolving of so many approaches and trends, it can be difficult to imagine an art world in which the grand force of art history was still seen as a kind of actor in the world of artists, critics and dealers. That this grand force was broadly understood through the writings of a single critic—advocating for the work of a single group of older, white male abstract painters—appears almost as an ancient superstition, a Hegelianism that may be rationally documented but never truly shared.

But while the rupture of the narrow teleology of Greenbergian modernism cleared the ground for the broad, synchronic catholicism of the art world after the 1960s, both period writers and subsequent scholars have been at pains to emphasize the ways in which this rupture broke along fault lines retrospectively visible in the lineaments of modernism itself. For figures ranging from Donald Judd to Miwon

1 Quoted in Robert Pincus-Witten, 1977, 105. Quotation reworded slightly for clarity. Bochner's question was likely a jab a pointed at Greenberg, who had characterized the work of Bochner and his peers as comprising "a style that promises—or perhaps one should say threatens—to become our period style." Bourdon, 1966, 54.

Kwon, this dissolution might be briefly rehearsed as such: as paintings became optically flatter, they drew increasing intention to their actual spatial extension as canvas stretched on supports. As these paintings became more like objects in the "real world," they raised questions about the relationship between their own real spatiality and the physical forms of their viewers.[2] And as focus turned to the lived phenomenology of the viewer, the possibilities for addressing issues such as identity construction, political structure and technological upheaval all sprang to the urgent forefront of artistic investigation.

This paper, co-authored by art historian and a mathematician, takes a slightly different approach. While we accept the premise laid out by Kwon, Briony Fer and others that the collapse of modernism in the visual arts developed through a logic delineated within modernism itself, we here argue that this collapse was symptomatic of a much broader unraveling of the intellectual fabric of modernism writ large. Making this case requires a shift in our understanding of what comprises the defining feature(s) of modernism. Rather than the internal features to which Clement Greenberg insisted painting should aspire in order to entrench itself "more firmly in its areas of competence," we posit that the development of modernist painting can be understood as an example of an attempt to produce a mutually exclusive and collectively exhaustive set of parameters, an encyclopedic system of types.[3] This ambition, which Greenberg himself alluded to in "Modernist Painting," runs in parallel to the encyclopedic impulses within the mathematical, physical, natural and social sciences, as well as humanistic and creative fields including literature and music. When framed this way, the emergence of particular features of art practice in the late 1960s can be seen to follow patterns that resonate with similar developments in other, far-flung fields of intellectual investigation. Among the farthest removed in terms of content, but among the closest of in terms of resonance of form, is the field of mathematics.

The attempt to systematize mathematics, or in technical terms produce completeness in mathematics, emerged in the late nineteenth century. Completeness is a term of art in mathematical logic, but for the purposes of this paper it can be stated as follows: a formalized mathematical theory is *complete* if given any statement S expressible in the theory's language, either S or the negation of S is provable within the theory. The Vienna Circle mathematician and philosopher Rudolph Carnap

2 Judd, 1965, 809-812. Kwon, 1997, 85-110. See also "One Place after Another: Notes on Site Specificity" *October* 80 (Spring 1997): 85-110. See also Briony Fer, 2004, 198.

3 Greenberg, 1986, 85.

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defined the concept this way:

> [There is] the conception according to which the completeness of an AS [axiom system JK] requires that the system should encompass and deal with the totality of the theory it is intended to ground, so that each pertinent question which can be framed in terms of its basic concepts must be answerable either one way or the other by means of deductive inferences form its axioms.[4]

Different ways of capturing completeness (or something very like it) were proposed by a number of mathematicians of the time, including David Hilbert and Bertrand Russell. While we will elaborate below on the relevant aspects of these mathematical programs, especially Russell's theory of types with its distinctly Greenbergian rhymes, the salient feature of these foundational projects was their focus on the creation of a so-called "adequate" formal system for mathematics. The system envisaged by Hilbert would be complete—it would allow all valid theorems to be derived from it—finitary, or, as it was called, *concrete,* and free from internal contradiction. A methodological necessity of what came to be known as the Hilbert Program, was that this last would be shown from within, that is to say, the system would prove its own consistency. This proof would produce, in part, a *grounding,* or at the very least it would assuage worries about the consistency of mathematics as well as other methodological concerns which had emerged in the late 19th century.

Seen in this broader light, the development of modernism in the visual arts parallels the development of foundational programs in mathematics, as another example of a program designed to produce a grounded, necessary, and finite set of laws that aimed towards a completion for their subject. While Greenberg himself offered his own famous articulation of the rules of medium-specificity of paintings to which properly modernist works should aspire, the impulse to rationalize painting as a total system runs through the work of many of the most important early 20th century abstractionists, ranging from the paintings-catalog imagined by Wassily Kandinsky to the aspirations of Piet Mondrian and Kazimir Malevich to realize an aesthetic terminus, a final style beyond which no further development would be possible. By the beginning of the 1960s, there was a collective sense among both apologists and detractors that such an endgame had been reached—the critical rhetoric around Frank Stella's black paintings providing a

4 Quoted in Alberto Coffa and Wessels, 1993, 274.

particularly clear illustration of the sense that painting had nowhere else to go.

Synchronously with the painting-as-object *cum* real-spatial sculpture trajectory sketched above, another overlapping circle of artists was adumbrating a different way beyond the historical dead-end of painting. Rather than plying the boundary between art objects and actual objects, artists such as John Baldesarri, Mel Bochner, Dan Graham and Robert Smithson rendered porous the division between words and images. As critic Craig Owens has contended, it was this "eruption of language into the aesthetic field...[that was] coincident with, if not the definitive index of, the emergence of postmodernism."[5] But while Owens suggests that these approaches drew their power from the way in which they troubled the modernist medium-specificity of both painting and literature, we would contend that the "eruption of language" represents an unraveling of the project of modernism *because of the possibilities for self-reflexiveness it created.* Our contention here is that this auto-referentiality, which was of a completely different kind than the proper self-criticism cherished by Greenberg, hopelessly jumbled the threads that the modernist aspirations to completeness had hoped to fully disentangle.

In the distal domain of mathematics, this looping auto-referentiality conclusively undermined the clean linearity central to the modernist aspiration to produce a delineated catalog of everything.[6] The key innovation was introduced by the Austrian mathematician Kurt Gödel. In essence, Gödel introduced a novel concept of numerical encoding, under which a mathematical proposition may be viewed, simply, as a number. As syntactic objects became numbers, mathematics developed an ability to "refer to itself", to frame assertions about its own syntax. Gödel used this technique to encode a modified version of the ancient "Liar's Paradox," the classical version of which can be phrased: "This statement is false."

When pressed, John Baldessari's *This is Not to Be Looked At* (1968)

5 Owens, 1979, 126.

6 By modernism in foundations of mathematics we mean to refer to the common objective of the various foundational programs that emerged in the late 19th and early 20th centuries, to give a formal reconstruction of mathematics. In technical terms, this would mean embedding mathematics in a formal language with an exact proof concept and an exact semantics, such that the proof concept is sound and complete with respect to the associated semantics as well as syntactically complete in the sense that all propositions that can be written in the formalism are also decided. The Hilbert Program is a canonical example of mathematical modernism in our view. See Kennedy, 2013, 352. for a discussion of other senses of the term modernism in mathematics see Corry, forthcoming as well as Gray, 2008. *Plato's Ghost: The Modernist Transformation of Mathematics* (Princeton University Press, 2008).

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can be viewed as a visual embodiment of the paradox at the heart of Gödel's refutation of the Hilbert Program (Cover Image, Figure 1). And while this is a strikingly resonant example, this strategy of visual/textual auto-reference became an important leitmotif also in the work of artists such as Dan Graham, Mel Bochner, Lucy Lippard and Adrian Piper. This is not to suggest that Baldessari *et al.* were influenced by Gödel, though there is some indication that awareness of his theories was percolating amongst conceptually-minded artists in the late 1960s.[7] Rather, we hope to make a stronger claim. As Gödel demonstrated, a robust intellectual structure is potentially *self-undermining*, because it can use its own robustness, its own expressive power, to generate paradoxes. We are suggesting then, that just as in the case of Gödel's incompleteness theorems, the work of these artists constitutes a clear response to a property of systematicity itself, in which a system's increasing denotative power must eventually conflict with constraints imposed by self-description. This analogy even suggests that its terms can be reversed: the emergence of postmodernism in the visual arts might be conceptualized as retrospective evidence for a kind of "postmodern mathematics."

To Complete Painting

In delineating an understanding of modernism that would allow us to figure the established Greenbergian trajectory as an exemplar of broader intellectual trends, it will be helpful to identify our touchstones. This paper, following from Greenberg's own citation of Kant, will refer to a vision of modernism as animated by the attempt to produce a fully fleshed out system of knowledge, one capable of refining itself as it progressed towards a description of the world in totality. This ambition, inherited from Descartes' self-criticism as well as Kant's massive epistemology, seemed to many to be near a possible fulfillment in the early 20th century. Outside of philosophy, this impulse found articulation in many different ways, such as the systems of efficient rationalization that sprang up to manage workforces (Taylorist production) and populations (Foucauldian bio-politics). The drive to produce a fully systematic picture of the natural world animated attempts to produce comprehensive catalogs of the world's natural species and racial sub-types. It was to this *telos* that Heidegger referred when defining "the fundamental event of modernity" as "the conquest of the world as picture."[8]

7 Among the most tantalizing of these clues was is P.J. Fitzpatrick, 1973.

8 Heidegger, 2009, 221.

Though such a scientifically inflected quest for completeness may now feel foreign to the development of artistic practice, the optimism that the space of "art," and specifically, "painting" could be fully described and ordered was a refrain which ran through the ideas of many of the pioneers of what would later be described as modernism. As historian Anthony Julius has described the advent of pictorial abstraction: "There was no turning back. Pictures made by the application of a paint-soaked brush to a canvas supported by an easel and thereafter framed are a mere sub-set of all possible painting."[9] For Julius, the development of painted abstraction also entailed the adoption of a rationalizing quest to fully delineate the space of "all possible painting."[10] Indeed, the emergence of this idea in artists' writings antedates Greenberg's theories by several decades—from Wassily Kandinsky's totalizing system outlined in *Concerning the Spiritual in Art* (1912) to Mondrian's postulations regarding the objective laws of aesthetics in *Plastic Art and Pure Plastic Art* (1937).

Indeed, Mondrian's manifesto—completed in Paris the year before he fled to New York in advance of the Nazi invasion of France—marks a key turning point in which the center of gravity of the modernist project shifted from Europe to New York. Although Kandinsky's writings had been available for decades—excerpts of *Concerning the Spiritual in Art* had been reprinted in Alfred Stieglitz's influential *Camera Work*—it was only in the wake of World War II that American artists located themselves at the forefront of this project. As such, the writings produced by Clement Greenberg against the backdrop of the war provide a window onto modernism's transformation into an American venture.

Greenberg cites the originary impulse for painted abstraction in the gradual flattening of the pictorial space in the late 19th century. Pace Greenberg, painting slowly "surrender[ed] to the resistance of its medium," abandoning its age-old task of turning the canvas into a hole or window through which one could perceive a depicted world. Rather than a transparent membrane, the canvas surface began to figure precisely as itself—as a colored plane that registered only optical depth.[11] This reductionism lead to a further purging of outside influence, striving, as Greenberg put it, towards "a purity and a radical delimitation of their fields of activity for which there is no previous example in the history of culture."[12] In a follow-up essay, published nearly two decades later, Greenberg would expand upon the precise outlines clarified and reinforced by this drive for purity. "The limitations that constitute the medium of painting," such as "the flat surface, the shape of the support, the properties of the pigment" were, according to Greenberg, "treated by the old masters as negative factors. However, he maintained, "under Modernism these same limitations came to be regarded as positive factors, and were acknowledged openly."[13] In essence, the arc of Greenberg's modernism has painting becoming ever more exclusively about its own status as painting.

Scholars such as Caroline Jones have offered detailed analyses of the trajectory of Greenberg's ideas and their ascent into a kind official ideology of advanced mid-century art.[14] But for the purposes of the present argument, the most significant aspect of Greenberg's theories is the way in which they embrace a foundationalism resonant with the mathematical programs to be adumbrated in the section below. In his key "Modernist Painting" (1960), Greenberg notes that he hopes to draw out many of the features that had heretofore only implicitly structured modernist pictorial abstraction. In so doing, the program of abstract painting could aim to achieve a rigor on a par with that of modern scientific (or for our purposes, mathematical) exploration. In explicating how painting could seek to foreground its own structuring conditions, Greenberg writes:

> Scientific method alone asks, or might ask, that a situation be resolved in exactly the same terms as that in which it is presented. But this kind of consistency promises nothing in the way of aesthetic quality...what their convergence does show, however, is the profound degree to which Modernist art belongs to the same specific cultural tendency as modern science, and this is of the highest significance as a historical fact.[15]

For Greenberg himself, modernist painting and modern scientific methodology were of a piece with one another, both being constituted within an overarching teleology of refinement towards an unknown but imaginable objectivity.

The many threads of this story—the development of rigorous methodology for modernist abstraction, the refinement of disciplinary exclusivity, the transference of its protagonists from Europe to America—

9 Julius, 2006, 116.

10 For an additional treatment of this theme see Golding, 2000.

11 Greenberg, 1993, 34.

12 Idem, 86.

13 Idem.

14 Jones, 2006, 205-303.

15 Greenberg, 1986, 91. See also Jones, 2006,, 61,82

can be read in a telling series of review Greenberg published in early 1945. In response to an exhibition of the work of Kandinsky, Mondrian and Jackson Pollock, Greenberg maintained a high-handed dismissal of the former artists while offering a nearly unqualified embrace of the later. While for Pollock, Greenberg could not "find strong enough words of praise," Kandinsky was overly influenced by his relationship with avant-garde music, and Mondrian was "Platonizing," "naïve" and guilty of having "attempted to elevate as the goal of the total historical development of art what is after all only a time-circumscribed style."[16] This last charge is a curious one, one which shows Greenberg's ambivalent attitudes towards the role that History should play in guiding art practice. While he was as convinced as any of the most diehard avant-gardists that abstract painting was impelled by the historical development of Western art, he was less certain that it entailed a historical terminus. For Greenberg, abstraction was the definitive next step. What lay beyond in the stage to follow, he emphatically did not hazard to guess.[17]

Painting Exhaustion, or Fighting for Stella's Soul

Twenty years after Greenberg's initial abstract painting apologia, and coincident with the publication of his "Modernist Painters" essay, the trajectory he had been tracing seemed to have come to a terminus in contemporary practice. As the critic and frequent Greenberg disputant Harold Rosenberg put it in 1963, "[Barnett] Newman shut the door, [Mark] Rothko drew the shade, and [Ad] Reinhardt turned out the lights."[18] Indeed, the painter Ad Reinhardt described his black near-monochromes from the early 1960s as "merely making the last painting which anyone can make."[19] The difficulty that practitioners of reductionism inevitably ran into was, predictably, the depletion of possible elements to reduce. The number of painters working in monochrome (or quasi- monochrome) proliferated, while possible paths beyond this reductionism became harder to imagine.

One of the few artists who seemed to point to a considered way forward was Frank Stella. Although Stella's canvases were nearly as Stygian as Reinhardt's, he began inscribing them with lines that reprised the external shape of the canvas. These lines suggested the idea of producing differently configured canvases, and Stella began

16 Greenberg, 1993, 17-19.

17 Idem., 37.

18 Quoted in Kellein, 2014.

19 Glaser, 1991,13.

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creating canvases shaped into a variety of geometric forms (Fig. 2). These shaped canvases seemed to provide a realization of Greenberg's dictum that modernist paintings "impose the picture's framing shape as a regulating norm with a new force and completeness by echoing that shape so closely."[20] However, Stella's canvases also presented a danger as well, in seeming to provide a precedent for the venerated tradition of painting eventually degenerating into the production of mere, physical objects. Greenberg's student Michael Fried referred to this as a "fight over Stella's soul," with proper Greenbergian modernism one on side, and the corrupting influence of what would become Minimal sculpture on the other.

In this spiritual tug-of-war, Fried considered himself to be particularly at odds with Carl Andre, a pioneer of sculptural work composed of modular units built not on a pedestal-centric configuration but out into the real space of the viewer. Andre's floor-bound fire bricks and zinc plates would soon be joined by all other manner of regularized industrial materials: Robert Morris' plywood constructions, Dan Flavin's light fixtures and Donald Judd's aluminum boxes.[21] As art historian Elizabeth Legge has argued, for Judd in particular the industrial box became the natural afterlife of the now-expired rectangle of painting. According to Legge, Judd "argued that the rectangle had become a "definite form" rather than a "neutral limit," compromised by its association with the rectangle of the conventional canvas. The rectangle, for the minimalists, had come to stand for the exhaustion of painting."[22] In the widely accepted narrative, this exhaustion precipitated an unraveling: the neatly delineated, medium-specific boundaries of boundaries came unwound into what Rosalind Krauss presciently termed "the expanded field" of contemporary art practice. But this turning outwards—painting becoming object becoming postmodern installation—was not the only response to the perceived exhaustion of the signal form of modernism. A different group of artists pushed in a markedly different direction. These artists turned painting more deeply inwards, using the concept of reflexive critique not to install the media more firmly in its arena of Greenbergian competence but rather to undermine this solidity from within. In order to situate this alternative, we must make a detour into the history of mathematics.

Producing Every Theorem, Generating Paradox

20 Greenberg, 1986, 90.

21 Meyer, 2004, 16

22 Legge, 2009, 74.

While Greenberg did not specifically elaborate on the details through which modern art "belongs to the same specific cultural tendency as modern science," one resonance that he clearly had in mind was the application of self-critical method towards the mutually exclusive and collectively exhaustive delineation of the different entities that populate the space of "painting." It is very striking that a similar intellectual impulse manifested itself in the numerous late 19th and early 20th century foundational programs in mathematics—in the case of mathematics, as a response to various crises that had emerged alongside the introduction of novel mathematical concepts such as the higher infinite. Indeed, from this point of view, Greenberg's ideas about the development of modernism as a progressive purification of the genres of cultural production (painting becoming ever more like painting), occupies the same conceptual territory as many of the above-mentioned foundational programs, in particular Bertrand Russell's type theory, a foundational program aiming to ground mathematics by means of a set of complex typologies that, for reasons of logical consistency, have to be kept rigidly at bay from one another. Specifically, a Russellian type structure stratifies the conceptual field according to a scheme which takes the initial state of the system at the ground level, and then forms subsequent levels by internalization: thus objects at a given level are absorbed into the level directly above; and objects of this next, higher level are equipped with a mechanism enabling them to act on—speak about—the newly internalized objects. This production of levels is then iterated ad infinitum.

Type theory came about as a way of repairing an earlier foundational system due to Gottlob Frege, set out in his 1887 *Grundgesetze*, which allowed the formulation of a self-referential paradox. As Russell explained in 1919,

> Normally a class is not a member of itself. Mankind, for example, is not a man. Form now the assemblage of all classes which are not members of themselves. This is a class: is it a member of itself or not? If it is, it is one of those classes that are not members of themselves, i.e., it is not a member of itself. If it is not, it is not one of those classes that are not members of themselves, i.e. it is a member of itself. Thus of the two hypotheses – that it is, and that it is not, a member of itself – each implies its contradictory. This is a contradiction.[23]

23 Russell, 1919, 136.

Russell's solution lay in a *post hoc* rule in which transformations could only move down in the classification schema.

We will return to Russell's typological repair in a moment, but in order to properly attend to the recursive strategies of 1960s conceptual art, we must address the foundational program put forward in the early 20th century by the German mathematician David Hilbert, which was a sequel to Frege's. As background, the 19th century saw the rise of what is now called "pure mathematics," by which is meant the development of mathematics on the basis of methods and concepts of a very high degree of abstraction, completely severed from any overt connection to the empirical domain.[24] This shift of perspective turned out to be very fruitful; on the other hand, certain theoretical oddities began to emerge—pathological examples of familiar concepts, anomalies surrounding Georg Cantor's conception of the higher infinite, Russell's discovery of an inconsistency in Gottlob Frege's *Grundgesetze*—generating an unease, if not an outright suspicion, that mathematics had put itself onto shaky ontological, if not even methodological, ground.[25]

Hilbert took it upon himself to demonstrate once and for all the soundness of these new methods. "No one," he would famously say, "will expel us from the paradise Cantor has created for us."[26] Moving beyond arguments for the consistency and reliability of mathematical methods based on any exterior, a priori philosophical discourse, at the core of Hilbert's view was the idea that mathematics would set its own grounding, using the tools of *mathematics itself*.[27] The program gave a perfect mathematical expression to this principle of self-reliance: using only finitary concepts, Hilbert sought to prove three core principles: completeness (all statements of the language could be demonstrated via proof, or refuted); self-consistency (no false statement could be demonstrated via proof) and conservativity (all truths could be proved without infinitary concepts).

It is ironic that the crystalline clarity of the program, which surpassed any previous attempt, set the stage for its collapse. This collapse was catalyzed by the incompleteness theorems Kurt Gödel published in 1931, theorems which had a distinct formal resonance with

24 E.g., the Cantorian higher infinite, but also so-called "imaginary numbers" and higher dimensional space.

25 Frege's 1893 *Grundgesetze der arithmetik* was essentially the first attempt to lay down the basic principles of arithmetic.

26 Hilbert, David, 1918a, "Axiomatisches Denken", *Mathematische Annalen*, 78: 405–15. Lecture given at the Swiss Society of Mathematicians, 11 September 1917.

27 Hilbert, 1918a,: 405–15.

Russell's paradox, observed by Russell three decades earlier. Hilbert's foundational project entails the use of specific syntax: a fixed, finite alphabet in which every mathematical proposition can be expressed. With this precise syntax in hand, Gödel's innovation was to *arithmetize the syntax* so that each proposition expressible in the language is assigned a number, its so-called *Gödel number*. But then if a proposition can be viewed as a number, this means that a proposition can also say things about other propositions (so long as the latter appear through their Gödel numbers)—in fact, a mathematical proposition can say something about itself.

Of pivotal importance for the aspirations of the Hilbert Program, a single mathematical proposition can be made, not just to refer to itself, but—apparently—to contradict itself. The result of this seemingly harmless innovation was to demonstrate not merely the essential *incompleteness* of the systems the Hilbert Program had put forward, but the incompleteness of all the foundational systems that had been proposed to date, including Russell's type theory.[28]

The proof of Gödel's first incompleteness theorem can be rehearsed as follows. Consider the statement S(x), which says: "x is not provable." Now construct *A* with Gödel number *s* such that *A* is equivalent to S(*s*). Now, if *A,* and hence S(*s*), were provable in the system under consideration, then it would true, i.e. *A* would be not be provable. This shows that *A*, and hence S(*s*), is not provable, and at the same time it follows that *A* is true, because what it says is the case. But then the negation of *A* is also not provable. Gödel's move was patterned exactly after the classical conundrum known as the liar's paradox: "This statement is false." If it is true, it becomes false, but if false, it becomes true.[29]

The expressive capacity of the simple theory of types, the system Gödel used to prove his theorem, allowed a pernicious form of self-reference to be implanted within it. This did not destroy type theory—no actual inconsistency had been shown—but it destroyed the grand ambition of the modernist foundational project to systematize mathematics in such a way that the solvability of every question could be, in principle at least, shown.[30]

28 Gödel referred to his proof as a "parlor trick". See Kreisel, 1980, 148-224.

29 More precisely, the paradox follows once Hilbert's systems are assumed to be complete and self-consistent. One also assumes that the system under consideration is sufficiently expressive, i.e. it contains enough arithmetic to carry out the arithmetization. Another crucial technical requirement is the representability within the formal system of the informal concept of provability.

30 In the second incompleteness theorem Gödel destroyed the second leg of the Hilbert

The attempt to refine, perfect and purify mathematical practice by reducing that practice to its essential logical core; the idea of purging mathematics of the "ontological and methodological slums that had grown up in it over the centuries", as Quine would later say, had left mathematicians with a too dry forest.[31] In the end, it took very little to set it alight.

The Eruption of (Self Referential) Language

While one should not minimize the originality of Gödel's approach, pernicious self-reference had already been shown to be an inherent part of the modernist grounding programs delineated by figures such as Frege. Self-reference had also been used by Cantor, as a way of charting the higher infinite. What was not seen by Russell and Hilbert, was that self-reference could also be used to attack claims of completeness. The very robustness of particularly the systems of the Hilbert School created this kind of blind spot. For the authors, the necessity of this tradeoff—between the expressive power of a system and its facility in producing pernicious self-reference—is the clearest explanation of how and why Greenbergian modernism unraveled in the way that it did.[32]

As artists in both the US and Europe made extensive use of textual strategies such as recursion—a phenomenon analyzed in greater depth by historian Liz Kotz, among others—a set of examples illustrate the Gödelian rhymes at work in the art world with particular clarity. Works such as Dan Graham's *Schema* (*March 1966)* (1966-70), Robert Smithson's *Heap of Language* (1966), Joseph Kosuth's *Definition* (1966), John Baldessari's *This Is Not To Be Looked At* (1968), Mel Bochner's *Actual Size* (1968) and Louise Lawler's *Fragment|Frame|Text* (1984) all employ strategies of self-reference and self-negation in order to inject an instability or undecidability into a larger system. Baldessari in particular

Program, by showing that any system of the type considered by Hilbert and his school, could not prove its "own" consistency in a finitary fashion.

31 The philosopher W.V.O. Quine famously used this colorful terminology in describing the ontologist's task: "On the other hand it is scrutiny of this uncritical acceptance of the realm of physical objects itself, or of classes, etc., that devolves upon ontology. Here is the task of making explicit what had been tacit, and precise what had been vague; of exposing and resolving paradoxes, smoothing kinks, lopping off vestigial growths, clearing ontological slums." Quinte, 1961, 275.

32 Indeed, Owens' argument itself leaves an interpretive gap. Per Owens, the eruption of language "disrupted the stability of a modernist partition of the aesthetic field...dislodg[ing] literary activity from enclaves into which it had settled." ("Earthwords," 126.) He does not, however, provide an explanation for why language should play a privileged role as the vector of the postmodern, nor does he suggest a concomitant opening of the textual to visuality. It seems that the dissolution of modernist medium specificity is an effect, then, not a cause, of linguistic profusion.

turned this approach into a leitmotif in his art, and the below discussion draws on key examples from his work from the mid-1960s.

It should be noted that there are in fact scattered references to Gödel in period artist's writings—including a 1966 Bruce Nauman journal entry, a 1969 Carl Andre poem, and most tellingly, a reprint of a non-specialist explanatory article in a 1973 issue of the British journal *Art-Language: The Journal of Conceptual Art.*[33] However, the disconnected nature of these references suggest not so much a case of hidden influence, but an example of the larger art-world interest in contemporaneous developments in the worlds of Cold War era science and mathematics. Indeed, a particular set of artists was drawn to scientific ideas that entailed an essential epistemological limitation: information theory (Dan Graham), entropic decay (Robert Smithson), perceptual psychology (Bruce Nauman, Bridget Riley). These artists, working against the reigning orthodoxy of aesthetic modernism, gravitated towards non-aesthetic ideas that suggested the inherent untenability of such closed teleologies.

It is all the more striking, then, to observe the close resonance with Gödel's ideas.

In the cover illustration, the phrase "THIS IS NOT TO BE LOOKED AT" is written below a photograph of a 1966 issue of *Artforum* magazine, with a bold Frank Stella protractor painting on the cover. The splashy Stella—especially in the context of its appearance on the cover of a mid-1960s issue of *Artforum*—may be taken to refer to the afterlife of Greenbergian formalism in advanced painting. But the ambiguity of the pronoun *THIS* touches off a kaleidoscope of oscillating negations; it at once pleads the obsolescence of late-stage abstract painting, the irrelevance of extrinsic art criticism, and the instability of its author's own textual denouncement. It is in this last reading that the eponymous sentence appears at its most Gödelian, insisting that it itself is "false," or in the visual-art's equivalent, "not to be looked at." To complete the mathematical analogy, we might say that it is the possibility of the third (semantic self-negation) that definitively finishes off the first (modernist aspirations to self-contained purity and completeness).

The deeper one pushes, the more clearly one sees that this similarity is the result of a parallel set of parameters comprising "modernism" in disparate domains. The confusion entailed by Baldesarri's ambiguous "this" operates as conflating the levels of discourse: Stella's painting, *Artforum* criticism of the painting, Baldessari's critique of *Artforum*. Indeed, this pronoun level confusion,

33 See Nauman, 1981,3, Kotz, 2007, 151, Findlay, 1973 and Fitzpatrick, 1973. See also, Nauman, 1970, 44.

this slippage in a pronoun's referential field, is not confined to this one particular example, but recurs repeatedly in Baldessari's work from this period.[34]

The splitting off of discourse from meta-discourse became especially important to modernism both in the artistic and mathematical domains. Throughout almost of all of its history, painting had been seen to refer in a unidirectional manner: a depiction of a tree may refer to a tree, but one would not have said that the tree referred to its painted depiction. A work of art criticism could analyze a painting, but a painting could not contextualize a work of art theory.

Indeed, it was by contrast with the received genre of supplementary artist's writings that Craig Owens introduced the new development of conceptual text pieces. "For the modernist artist," Owens argues, "writing was not an alternative medium for aesthetic practice; through it work might be explained, but never produced."[35] And while these Greenbergian aspirations to divide visual from literary work trace back to Gotthold Lessing's 18th century *Laocoön*, the specific ontological division between modernist work and commentary is legible in Barnett Newman's oft-repeated quip about the irrelevance of art theory to studio practice. "Aesthetics is for me," he remarked in 1952, "like ornithology must be for the birds."[36] While intended as a jab at the pontification of critics and philosophers, Newman's aphorism demonstrates the perceived inviolability of the division between the discourse (of painting) and the meta-discourse (of criticism and aesthetics).

A similar inviolability of the levels of discourse had also held sway in mathematics, prior to 1931. Thus a proposition concerning, say, a family of 2-dimensional curves, would not have been thought of as itself a point on such a curve. And we noted above that Russell's type theory has built into it, in order to avoid paradox, a rigid stratification blocking the formation of classes that are not members of themselves. Although this took care of inconsistency, it took Gödel to see the vulnerability of Russell's rigidly typed hierarchy to another kind of quasi-paradox, insofar as type theory claimed to be complete. Russell's discourse/meta-discourse distinction was thought to be in harmony with, and indeed deliver, completeness—the solvability of every problem. But Gödel's (and Baldesarri's) innovation was to turn this one-way circuit

34 The most succinct version of this kind of referent-play is in his *Wrong* (1967). But the level confusion is perhaps most clearly illustrated by *A Painting That is its Own Documentation* (1966-) 106, which lists the creation and ongoing exhibition history of the painting.

35 Owens, 1979, 127.

36 Quoted in Mattick, 1993, 253.

of reference back around—to use components of system to refer back up the typological hierarchy, thereby, in Gödel's case, undermining the foundationalist ambitions of the time, Russell's as well as others. Without stretching the analogy too far, we might say that, as Gödel's means of overcoming this one-way limitation had been to encode propositions by means of numbers, Baldessari encodes a large body of images (modernist abstraction) by means of an image (a photograph of the cover of *Artforum*).

Different than another painting that would simply participate in the recent history of abstract painting, a photograph reads as an encoding of this recent history *in toto*. Photography as a coding device calls to mind Roland Barthes's well-known essay "The Photographic Message," and we may read Baldesarri's experiments with carefully selected combinations of photographs and text as a demonstration of the power of the caption on which Barthes expounds in this essay. But in light of the present discussion, we may also see the mathematical architecture of Baldessari's critique as a means of complicating Barthes' ideas. In searching for an example of a system as purely denotative as the press photograph is thought to be, Barthes contends that "mathematics" is "a denoted structure without any connotation at all."[37] This purely content-less system is a hallmark of the austere modernism of Hilbert's system; but as Gödel demonstrated, connotation, or in foundationalist terms, semantics, are ineliminably present in any sufficiently expressive (or robust) system. Thus the Barthean/Hilbertian aspiration to purity and completeness must remain out of reach.

Perhaps the clearest and most broadly distributed examples of what might be described as this interest in meta-level confounding can be seen in the profusion of the number of artists interested in the map/territory problem. Briefly stated, this philosophical question explores the nature of the relationship between a physical territory and the mapping systems that describe it at a remove (much as a painting might describe a tree, or a treatise might describe a painting). While Robert Smithson and Mel Bochner produced "The Domain of the Great Bear," a speculative essay on universal maps inspired by Jorge Luis Borges' short story of a destroyed map that had a 1-to-1 size correspondence with its territory, other artists including Michael Baldwin and Terry Atkinson (*Map of Itself,* 1967), Dennis Oppenheim (*Annual Rings,* 1968), and Douglas Huebler (various *Location Pieces*, 1968-1971) produced works that aimed to confuse or invert the ostensibly straightforward relationship between a map and its territory. Baldessari himself produced *California Map Project* (1968), a series of photographic images taken at the places denoted within the letters C-A-L-I-F-O-R-N-I-A in a map of the state (Fig. 3). Though it was certainly intended as a humorous piece (as many of Baldesarri's works were), the *California Map Project* enacts a kind of cartographic impossibility: using the artifacts of the map to generate a newly demarcated territory that could be then re-mapped through the camera.

And while many of these examples operate by means of negative tautologies and foreclosures, Baldesarri's *A Work With Only One Property* (1966-8) offers a kind of counterpoint: a feed-forward mechanism that perpetually defers completeness and closure (Fig. 4). The piece is among Baldesarri's most spare, and consists simply of a grey rectangle of canvas with its title emblazoned in all capital, san-serif font just above the centerline. There is no pronoun ambiguity here: the work with only one property is the painting beheld by the viewer. But the property it has is slippery: it has the property of having the property of having a sentence written on it that declares that it has the one property of having the one property, *ad infinitum*, like a Turing Machine that never halts, being programmed to perform an infinite cycle.[38] Viewed as such, *A Work With Only One Property* shows itself as a special kind of *language game,* in Wittgenstein's sense, in which, as Wittgenstein noted of Turing's (diagonal) argument, the viewer acts according to a single tautological rule. As logician Georg Kreisel phrased Wittgensten's dictum: "Write what you are writing".[39]

In Baldesarri's work from the period, this gesture ultimately effects an opening out—a new start for a kind of artmaking that hit a terminus in the black monochrome. Evidence for this optimism can be seen not only in the absurd humor that permeates his work, but in his careful selections of text extracts and captions. *Examining Pictures* (1967-8) provides a particularly clear illustration (Fig. 5). Drawing on text with a style appropriated from an instruction manual targeted at hobby painters, Baldesarri rhetorically asks his viewers "What Do Pictures Consist Of?" As expressed in the rest of the text, pictures are seen to consist of their style and subject matter, and the history of art can

37 Barthes, 1978, 18.

38 A Turing Machine can be designed to "feed-forward" endlessly, so that the computation it performs never halts. The so-called Halting Problem, the question whether it can be determined in advance whether a Turing Machine halts or not, is unsolvable as was proved by Turing and Church independently in 1936. The proof relies on a diagonalizability argument essentially identical to that used both by Gödel for his incompleteness theorem, and by Cantor for an essential theorem about infinity. In fact, the unsolvability of the Halting Problem is just another way of viewing Gödel's incompleteness theorem. Turing, 1937 and Church, 1938.

39 Kreisel, 1950, 281.

be considered a history of attempts to enlarge this terrain. While the surface meaning implies a celebration of formalism (the infinite variety is evidenced by "the impressionists" and "the cubists"), there is the sense of Baldesarrian double meaning at play. The text's impersonal author suggests that this history of art will be a story without a conclusion: "There is no end," the image reads "to the number of different kinds of pictures."

Epilogue: Post-Modernity in the Expanded Field

The significance of these resonances between Frege and Russell's systems on the one hand, and Greenberg's systems on the other (as well as between the interventions of Baldessari and Gödel), points to the ways in which disciplinary specific histories are constructed not only internally, but also by frameworks and relationships that transcend the specific content domains. It is a property of a descriptive system that as it increases in robustness—the ability to express more and more—it necessarily opens itself up for self-undermining "paradoxes." Just as Gottlob Frege's attempt to produce an exhaustive catalog of "everything that can be thought" shares with Kandinsky's envisioned encyclopedia of every possible painting a modernist aspiration to completeness, the realization of the fundamental impossibility of this project set off a parallel set of responses.[40] For an historian of art and culture, this kind of structuralist thinking represents a departure from standard approaches, which (for good reasons) privilege local conditions and responses as explanatory of historical change. But for the historian of science and mathematics, for whom the parameters of epistemic possibility are more central to disciplinary narratives, what can the distal cultural expression of resonant ideas illuminate about the history of mathematical ideas?

Numerous historians and critics have characterized the period following the rise of conceptual art and minimal installation as one of postmodern eclecticism. Without the sense of somewhere that art was impelled to go, a *telos* towards which it must drive, artists felt free to go anywhere. Refuting her once-mentor Clement Greenberg, Rosalind Krauss famously diagnosed this as a "post-medium" condition, in which the narrative of medium specificity had to be obviated by a willfully grab-bag approach, in which artists might use means that were electronic or analog, spatial or imagistic, in service of their project. The critic Achilo Bonito-Oliva coined the term "the transavantgarde" to describe an Italian cohort of artists who rejected the linear march of History, one that an enterprising artist might aspire to lead. Rather than wrestling with their immediate predecessors and surroundings (as the avant-gardists had done) choosing instead to draw on sources ancient and recent, proximal and distant.[41]

From the foundations of mathematics point of view, it is striking that the loss of *telos* following the collapse of the Hilbert Program was also marked by a thoroughgoing eclecticism. This was manifested in the immediate aftermath of the incompleteness theorems by a splintering into subprograms founded on distinct *weltanschauungen*, whether platonistic or pragmatic, phenomenological or—somewhat incongruously in the wake of the incompleteness theorems—formalist. And while the mathematics of such programs continue to be actively pursued, more recently an even deeper eclecticism has set in within the foundational community at large, constructed from the search, not for a grounding but for an unveiling—a laying bare of the practice *in situ*, rather than in the shape of a formal reconstruction of it.

"Is it alright?" the philosopher Ken Manders has asked, taking note of this moment in foundations of mathematics when the pursuit of an absolute grounding gave way to the idea of "making clear":

> Is it **all right**?, traditional epistemology asks about knowledge claims. All schools in "logical foundations of mathematics" share this concern for reliability. But a long-term look at achievements in mathematics shows that *genuine mathematical accomplishment consists primarily in making* **clear** *by using new concepts*: ...Representations and methods from the reliability programs are not always appropriate.[42]

Manders is asking whether the center will hold through what one might call the post-modernist turn in mathematics, now that the concept of truth—in the absolute sense—is out of view. For Gödel's incompleteness theorems—an inevitable consequence of the eruption of language into the *mathematical* field—had ruptured the bond between truth and proof, revealed an epistemological horizon; a boundary beyond which true theorems may exist, but which can never be broached by mathematical demonstration (in the formal sense of the term).

In this way, and, as must be said, somewhat in opposition to Gödel's own view, the incompleteness theorems figure as part of a larger abandonment of the (absolute) concept of truth in the philosophy

40 . Frege, 1984, 112-21. Kandinsky, 1994, 170.

41 Krauss, 2000. Bonito Oliva, 1982.

42 Manders, 1987, 194-211. Bold face and italics in original.

of science. The pragmatist philosopher Richard Rorty, for example, sustained a forceful attack on the notion that science altogether (so not just mathematics) has a privileged access to an unknown but imaginable objectivity. As for naturalism, a dominant position in the philosophy of mathematics nowadays, the search for a sharp notion of truth is generally viewed as irrelevant to the naturalistic project of "tracking the practice."[43]

Perhaps the term post-modernism can be admitted as a variant on, if not a successor to, naturalism in mathematics. For the tendency to prescind from ideology, if not from a priori philosophical discourse altogether; to lower one's foundational ambitions; in particular the idea of pursuing grounds, if at all, locally and opportunistically, rather than globally and absolutely; and thirdly, the idea of fractured grounds—if mathematics is even thought of as grounded in the first place—are all consequent upon the path that led, in our view, to postmodernism in art: the eruption of language into the aesthetic field, setting the stage for pernicious self-reflection, followed by the collapse of the genre. What ensued in art was a patchwork practice; what is left of foundations of mathematics is a patchwork of theories, or in the philosopher Mark Wilson's terminology, theory façades—an atlas, rather than a scaffolding:

> In the days of old Hollywood, fantastic sets were constructed that resembled Babylon in all its ancient glory on screen, but, in sober reality, consisted of nothing but paste-board cutouts arranged to appear, from the camera's chosen angle, like an integral metropolis. In the billiard ball case, we witness sheets of mechanical assertion that do not truly cohere into unified doctrine in their own rights, but merely appear as if they do, if the qualities of their adjoining edges are not scrutinized scrupulously...they represent patchworks of incongruent claims that might very well pass for unified theories, at least, in the dark with a light behind them.[44]

For the postmodern mathematician, *encore mieux*—the working mathematician has always pushed the quest for the unified theory to the borders. For the modernist mathematician, the quest for the unified theory remains urgent. Post-modernism in science, and in particular Rorty's recommendation "to view science as one genre of literature, or, put the other way round—literature and the arts as inquiries on the same footing as scientific inquiries;" his synchronic, directionless view of scientific

43 Kennedy, 2013, 352.

44 Mark Wilson's *Wandering Significance* is a masterpiece of what one might call late modernism in the philosophy of mathematics. Wilson, 2006, 204.

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inquiry, has always been viewed by the modernist as putting mathematics directly in the path of Bonito Oliva's notion of the *transavantgarde*: an endless plane of options with no criterion capable of making comparisons of value.[45]

We close this paper by noting that both Rorty's pragmatism and Bonito Oliva's postmodernism seem to have provided an unexpected coda to Greenberg's assertion that "Modernist art belongs to the same specific cultural tendency as modern science." Of course what Rorty saw in hindsight, Greenberg could not have predicted: that intellectual structures and cultural tendencies can become self-refuting.

45 Rorty, 1982, xliii.

Figure 1:John Baldessari, *This Is Not To Be Looked At* (1966-8) Acrylic and photo-emulsion on canvas, 59 1/4" x 45 1/4" Collection of MOCA Los Angeles

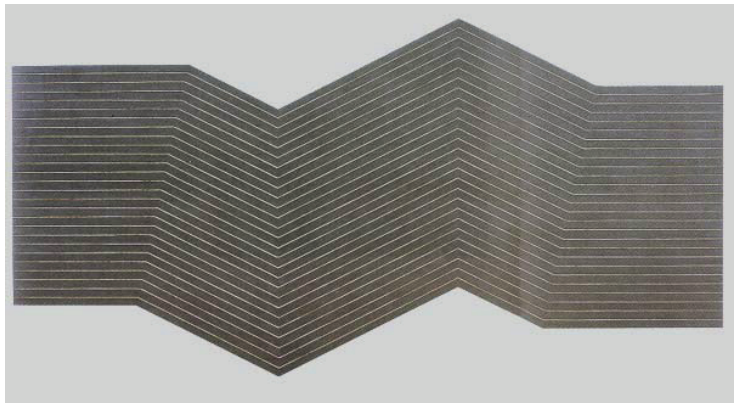

Figure 1:John Baldessari, *This Is Not To Be Looked At* (1966-8) Acrylic and photo-emulsion on canvas, 59 1/4" x 45 1/4" Collection of MOCA Los Angeles

Figure 3: John Baldessari, *California Map Project* (1969) DETAIL Eleven mounted chromogenic prints, 8" x 10" each Private collection

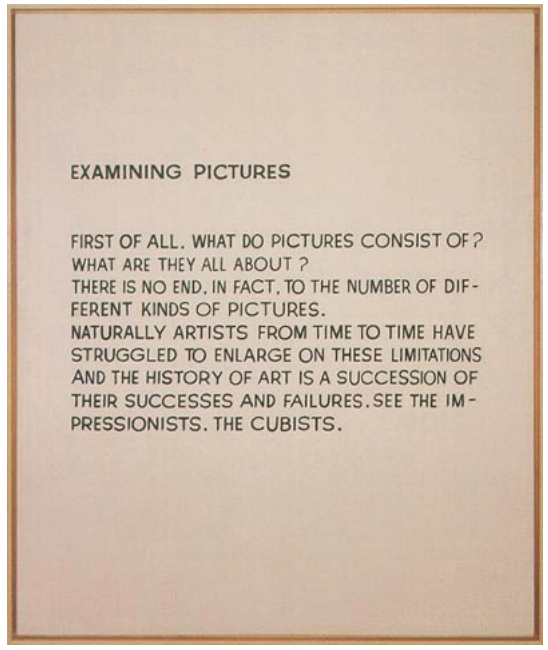

Figure 4: John Baldessari, *Examining Pictures* (1966-7) Acrylic on canvas, 68" x 56 1/2" Private collection

Bibliography

Barthes, Roland, 1978, 'The Photographic Message' trans. Stephen Heath *Image-Music-Text*, New York: MacMillan

Bourdon, David "Our Period Style," *Art and Artists* 1.3, June 1966.

Bonito Oliva, Achilo, 1982, *Transavantgarde International* exh. cat., Milan: Giancarlo Politi Editore.

Coffa J. Alberto and Linda Wessels, 1993, *The Semantic Tradition from Kant to Carnap: To the Vienna Station*, Cambridge University Press, 1993.

Church. Alonzo, 1936, 'An unsolvable problem of elementary number theory', *American Journal of Mathematics* 58,

Corry, Leo 'How Useful is the Term 'Modernism' for Understanding Early Twentieth Century Mathematics' in *Modernism in the Sciences ca. 1900-1940,* Berlin, Akademie Verlag, (forthcoming)

Findlay, JN, 1973, 'Gödelian Sentences: A Non Numerical Approach' reprinted in *Art-language: The Journal of Conceptual Art* 2.3

Fitzpatrick, PJ, 1973, 'To Gödel via Babel,' ---

Fer, Briony, 2004, *The Infinite Line: Re-making Art After Modernism*, Yale University Press, 2004.

Frege, Gottlob, 1984 'On Formal Theories of Arithmetic' in B. McGuinness ed., *Collected Papers on Mathematics, Logic, and Philosophy,* Oxford: Basil Blackwell

Glaser, Bruce, 1991, 'An Interview with Ad Reinhardt' in Barbara Rose ed. *Art-as-Art: The Selected Writings of Ad Reinhardt,* University of California

Gray, J. J. 2008, *Plato's Ghost: The Modernist Transformation of Mathematics*.

Greenberg, Clement, 'Towards a Newer Laocoö, and 'Modernist Painting' in ed. John O'Brian, 1986, *The Collected Essays and Criticism: Modernism with a Vengeance, 1957-1969,* University of Chicago Press.

--'Review of Exhibitions of Mondrian, Kandinsky and Pollock' and 'Review of an Exhibition of Hans Hofmann and a Reconsideration of Mondrian's Theories' in John O'Brian ed. 1993, *The Collected Essays and Criticism: Arrogant Purpose, 1945-1949*

Golding, Jonathan, 2000, *Paths to the Absolute:*
Mondrian, Malevich, Kandinsky, Pollock, Newman, Rothko, and Still, Princeton University Press.

Heidegger, Martin, 2009, 'The Age of the World Picture' in Günter Figal ed., *The Heidegger Reader: Studies in Continental Thought*, Indiana University Press.

Hilbert, David, 1918a, 'Axiomatisches Denken', *Mathematische Annalen*, 78: 405–15. Lecture given at the Swiss Society of Mathematicians, 11 September 1917.

Jones, Caroline, 2006, *Eyesight Alone: Clement Greenberg's Modernism and the Bureaucratization of the Senses,* University of Chicago, 2006.

Judd, Donald 1965 'Specific Objects' reprinted in Harrison and Wood eds. 2003 *Art in Theory 1900–1990,* Hoboken, NJ: Wiley.

Julius, Anthony, 2002, *Transgression: The Offences of Art*, University of Chicago Press

Kandinsky, Wassily, 1994, 'On the Spiritual in Art' *Art* eds. Kenneth Lindsay and Peter Virgo, *Kandinsky: Complete Writings on,* New York: Da Capo Press

Kellein, Thomas, 2014, 'Ad Reinhardt: Painting as Ultimatum' *The Brooklyn Rail*, Most easily accessed online < http://brooklynrail.org/special/AD_REINHARDT/ad-around-the-world/ad-reinhardt-painting-as-ultimatum> accessed 7 July 2017.

Kennedy, Juliette, 2013, 'On formalism freeness: Implementing Gödel's 1946 Princeton Bicentennial lecture,' *Bulletin of Symbolic Logic* 19.3

Kreisel, Georg, 1980, "Kurt Gödel, 28 April 1906 – 14 January 1978", *Biographical Memoirs of Fellows of the Royal Society*, 26

------, 1950,, 'Note on arithmetic models for consistent formulae of the predicate calculus', *Fundamenta Mathematicae* 37

Kotz, Liz, 2007, *Words to be Looked At,* MIT Press, 2007

Krauss, Rosalind, 2000 *A Voyage on the North Sea: Art in the Age of the Post-Medium Condition*, London: Thames & Hudson

Kwon, Miwon, 'One Place after Another: Notes on Site Specificity' *October* 80 (Spring 1997): 85-110.

Legge, Elizabeth, 2009, *Michael Snow: Wavelength*, Cambrige, MA: Afterall/MIT Press.

Manders, Kenneth, 1987,. 'Logic and conceptual relationships in mathematics' in *The Paris Logic Group*, Logic Colloquium '85, North-Holland: Elsevier Science Publishers B.V

Mattick, Jr Paul, 1993, 'Aesthetics and Anti-Aesthetics in the Visual Arts' *The Journal of Aesthetics and Art Criticism* 51.2

Meyer, James, 2004, *Minimalism: Art and Polemics in the Sixties,* Yale University Press.

Nauman, Bruce, 1981, *1|12 Scale Models for Underground Pieces* exh. cat, The Albuquerque Museum

--- 1970, 'Notes and Projects,' *Artforum* 9.4

Owens, Craig, 1979, 'Earthwords' *October* 10. 3

Pincus Witten, Robert, 'Mel Bochner: The Constant as Variable' *Postminimalism,* Torino, IT: Out of London Press.

Quine, WVO, 1961, ' *Word and Object,* MIT Press

Rorty, Richard, 21982, *Consequences of Pragmatism,* University of Minnesota Press

Russell, Bertand, 1919, *Introduction to Mathematical Philosophy*, London: George Allen & Unwin, Limited

Turing, Alan, 1937, 'On computable numbers, with an application to the Entscheidungsproblem', *Proceedings of the London Mathematical Society* 2.42

Wilson, Mark, 2006, *Wandering Significance: An Essay on Conceptual Behaviour*, Oxford University Press

Science, Language, and the "Truth of the Subject:" Lacan and Wittgenstein

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Abstract: One aim of this paper is to consider, in a preliminary way, how something having the structure of a "subject of knowledge" may be seen as related to the overall structure of truth, in the context of an appreciation of the structure and being of language as essential to any possible articulation of it. By reviewing the different positions of Lacan and Wittgenstein with respect to the Cartesian *cogito*, I argue that, within such a context, neither the subject nor "its" position can be understood as having the substantial being of an entity, and it is equally impossible to grant it an ontological consistency correlative to the total realm of scientific objectivity set over against it as the whole of truth. Rather, in the context of the application of a formal consideration of the character of the signifier as it articulates the structures of the subject's knowledge and truth, a subject of knowledge can only be characterized by reference to a constitutive inconsistency or splitting correlative to the incompleteness that henceforth marks the total field of scientific objectivity itself.
Keywords: Science, Language, Truth, Lacan, Wittgenstein

One aim of this paper is to consider, in a preliminary way, how one might understand any possible functioning of the category of the "subject" in relationship to that of truth, in a context shaped by the formal implications of the twentieth-century linguistic turn, both in its structuralist and analytic-philosophical variants. More specifically, I shall consider here the implications for the "position" of subjectivity of an appreciation of that aspect of the twentieth-century linguistic turn that adverts, in an ontologically realist way, to the structure and being of language as the essential support for any possible articulation of it. Within such a context, as I shall argue neither the subject nor "its" position can be understood as having the substantial being of an entity, and it is equally impossible to suppose for it an ontological consistency correlative to that of the total realm of scientific objectivity set over against it as the whole of the truth to which it has access. Furthermore, as I shall argue, one cannot adequately characterize the structural place of a subject of knowledge without understanding its linguistic support as operating in the formal mode of splitting or inconsistency that is implied by the incompleteness which henceforth marks the total field of scientific objectivity itself. Both this inconsistency on the side of the subject, and the incompleteness on the side of the world, here result from formal features of signification in relation to totality. As a consequence of these features, "the subject" correlative to the world as known disappears from its field, lacking any substantial support therein. In default of a

possible consistent knowledge of the whole, the position of the knowing subject in the world can only take the shape, as Lacan argues, of "some relationship of being that cannot be known", or of what Wittgenstein calls its integration into the "given" of forms of life.

I

Near the beginning of his 1965 "Science and Truth," Lacan opens a psychoanalytic discussion of the essential structure of what he does not hesitate to describe as a "subject" of science, correlative in its original articulation to the historical moment of science's founding in the modern sense of Descartes and Galileo. Taking as his guideline Koyré's thesis of a profound epistemological transformation, at this moment, in the position of the subject as thinker and knower of the world, Lacan describes this essential structure as witnessed in that of the Cartesian *cogito*, and in particular in the unequal relationships it uniquely establishes among knowledge, being, and truth:

> I did not thus just make an immediate pronouncement concerning psychoanalysis' vocation as a science. But it might have been noticed that I took my lead last year from a certain moment of the subject that I consider to be an essential correlate of science, a historically defined moment, the strict repeatability in experience of which perhaps remains to be determined: the moment Descartes inaugurates that goes by the name of *cogito*.
> This correlate, as a moment, is the defile of a rejection of all knowledge, but is nevertheless claimed to establish for the subject a certain anchoring in being; I sustain that this anchoring constitutes the definition of the subject of science, "definition" to be understood in the sense of a narrow doorway.
> This lead did not guide me in vain, for it led me at year end to formulate our experienced division as subjects as a division between knowledge and truth, and to accompany it with a topological model, the Möbius strip; this strip conveys the fact that the division in which these two terms come together is not to be derived from a difference in origin.[1]

In establishing, in other words, the "I think" as the radical anchor of any possible knowledge of objectivity, Descartes passes necessarily through the "defile" of knowledge that consists in the exercise of global

1 Lacan 1965, p. 856.

doubt, and hence the rejection of all knowledge that is not grounded in what he understands as the interiority and self-presence of the *ego cogito*. But in the passage from the "I think" to the "I am" that claims to secure the being of the subject and thus the truth of its ontological constituency, Descartes nevertheless establishes the subject's capability to situate itself within the real that is then understood as the true cause of its ontological stability. This situation will then subsequently be one in which the subject thus defined, as Lacan argues, is essentially and constitutively "split", caught up in a "constituting division" between knowledge and truth that henceforth defines both its structure and the field of possible scientific knowledge as objectivity that thereby opens up for it. This disequilibrium is such, Lacan argues, as subsequently to determine the being of the ego, in this sense, as one which radically grounds the totality of objective knowledge, but also essentially exempts itself from it; or, in other terms, as that which is essentially split between the founding function it maintains with respect to knowledge and the problematic structure of ontological self-founding that, in order to do so, it calls itself to perform.

Both the grounding function of the structure with respect to the totality of science's field of knowledge and the problematic reflexivity that in turn founds this function then regularly operate, unmarked, at the basis of "modern" science to secure the functioning of its ordinary claims to know. But it is the attention psychoanalysis pays to the structural essentiality of *language* that, alone, suffices formally to reveal the actually antinomic nature of these sustaining relationships between truth and knowledge on the level of the ontological disequilibrium they introduce into the being of the knowing subject as such. Here, the structuralism of Saussure and Lévi-Strauss plays for Lacan the privileged role of allowing a "logical" elaboration of the dialectic of the constituting division that defines the subject, thereby allowing psychoanalysis to articulate structurally its essential and constituting relationship to its vanishing object, what Lacan famously signifies as the "object *a*." This relationship – that of an "internal exclusion" in which the "object *a* must be inserted, as we already know, into the division of the subject by which the psychoanalytic field is quite specifically structured" – is, on Lacan's telling, first revealed in a formally clear way by structuralist linguistics in its accounting for the constitutive place of the "subject who speaks."[2] This speaking subject is – by distinction with the "subject of science" – here understood topologically and formally as constitutively within the "battery of signifiers" whose overall structure articulates the difference

2 Lacan 1965, p. 863.

between the linguistic position of enunciation and what is enunciated from it, leading to a set of distinctive structural antinomies of the subject's position in relation to this total battery itself.

But it is, according to Lacan, not structural linguistics but rather contemporary logic that is best capable of formally articulating the structuring effects of the primacy of the signifier for the definition of the subject of science itself, through its demonstration of the essential antinomies involved in any assumption of the totalization of this subject's claim to know:

> It is in the realm of logic that the theory's various refractive indices appear in relation to the subject of science....
>
> It is logic that serves here as the subject's navel, logic insofar as it is in no way linked to the contingencies of a grammar. The formalization of grammar must literally circumvent this logic if it is to be successfully carried out, but the circumventing movement is inscribed in this very operation.
>
> I will indicate further along how modern logic is situated ... It is indisputably the strictly determined consequence of an attempt to suture the subject of science, and Gödel's last theorem shows that the attempt fails there, meaning that the subject in question remains the correlate of science, but an antinomic correlate since science turns out to be defined by the deadlocked endeavor to suture the subject.[3]

If, in other words, it is an ambition of modern logic since Frege – up to and including the project of logical positivism – to ensure a formally adequate and methodologically transparent structural basis for the totality of possible knowledge of the real, then the limitative results that arise from its reflexive self-application bear confirming witness to the essentially antinomic structure of any position of knowing supposed to found itself on this basis. Lacan makes apparent reference, here, to Gödel's second incompleteness theorem, which shows the impossibility of proving, in any (actually consistent) formal system of sufficient strength to capture arithmetic, a statement of that system's own consistency. It thus proves impossible to secure the consistency of the methodologically formal *corpus* that is the basis for such a system's claim to articulate complete truth from within the field of demonstrated knowledge produced by that *corpus* itself.

More broadly, and as Lacan underscores elsewhere in discussing

3 Lacan 1965, p. 861.

Gödel's theorems, the more general phenomenon of incompleteness to which both theorems bear witness can be seen as formally demonstrating that there is, inscribed in the structure of any formalism adequate to scientific knowledge, "some relationship of being that cannot be known."[4] This relationship, which is, Lacan suggests, the sole concern of psychoanalysis in its investigation into the subjective support of the possibility of science, is witnessed in the fact that, as the first theorem can be seen as demonstrating, there is for every system some structurally articulated truth that can be recognized as such, but which it itself cannot demonstrate on the basis of its formal claim to know. In this respect, the essential incompleteness that Gödel's theorems demonstrate can also be seen as verifying the underlying disequilibrium between knowledge and truth that, then, essentially defines the position of any "subject" correlative to the totality of knowledge that the inscription of a logic offers to structure. If, then, Frege's attempts radically to exclude the individual subject of psychological experience from the objective field of knowledge (under the heading of his devastating arguments against psychologism) can also, as Lacan suggests, be seen as embodying the logicist or positivist project of a comprehensive "suture" of the formal subject of knowing to its field of possible knowledge, the result of this attempt is the return of this subject as structurally antinomic.[5] Divided between knowledge and truth, it is thereby shown to lack any non-contradictory support in being, on the level of the logic of formal demonstration by means of which it would establish its own position there.

Returning, then, to the structure of the *cogito* as the substrate of any possible knowledge of the world, Lacan emphasizes the radical implications for it of the fact of its essential linguistic support. That the *cogito* must be inscribed in language means that the particular mode of unequal relationship between truth and knowledge that defines the being of the subject must be understood as essentially passing through the structure of its signification, and thus as well through the particular signification of the "ergo" or the "therefore" which here purports to ground being in thought. Familiarly, this "ergo" is not a matter of straightforward logical deduction or inference, since the necessity of the grounding connection to which it adverts does not, in general, survive

4 Lacan 1973, p. 108.

5 As should be noted, it is problematic on both historical and conceptual grounds simply to identify, as Lacan sometimes does, Frege's logicism with the (much more empiricist) project of the "logical positivism" or "logical empiricism" of Schlick, Carnap, and Neurath, as well as to characterize either as formulating an ambition to ground the totality of (not only mathematical but also empirical) scientific knowledge in logic or formalism.

translation to the inferential relation of third-personal claims or truths.[6] But if, as this implies, the first-personal and indexical form of the terms it connects proves essential to the establishment of the problematic relationship it adduces, it raises the formidable problem for the subject of the reflexive moment or operation by which, in thinking, the subject of the cogito purports to ground its own being as self-caused. This problem of the subject's reflexive assumption of itself is then not separable from the problem of the basis of the repetition in the "cogito, ergo sum" of the signifier "I" in the particular mode of (self-)grounding that, here, links its two instances:

> Which is why it is worth restating that in the test of writing *I am thinking: "therefore I am,"* with quotes around the second clause, it is legible that thought only grounds being by knotting itself in speech where every operation goes right to the essence of language.
>
> While Heidegger gives us the expression "cogito sum" somewhere, serving his own purposes, it should be noted that he algebrizes the phrase, and we can justifiably highlight its remainder: "cogito ergo"; it is evident therein that nothing gets spoken without leaning on the cause.[7]

As Lacan emphasizes, the psychoanalytic interpretation of the structure of the cogito must accordingly consider the peculiar manner in which the *reflexivity* of the signifier "I" appears here to link thinking to being, invoking a grounding connection, signaled by the "ergo," which has no causal referent external to the relations of the signifiers themselves. On the other hand, it does not simply signal a straightforwardly *logical* deduction, as can be seen by reflecting on the modal features of the type of connection it is supposed to introduce. Somewhat notoriously, in introducing the *ego cogito* in the *Meditations*, Descartes never inscribes the "ergo," mentioning there only the necessary truth of the proposition "I am, I exist" [*ego sum, ego existo*] "every time I utter it or conceive it in my mind."[8] Familiarly, though, if the claim of existence is here taken as having reference to an empirically constituted individual, the claim of existence cannot be taken as necessary in an objective and modal

6 Thus, for instance, the purported inference (if such it is) from "I think" to "I am" does not survive translation, for example, to a fictional context: that Hamlet thinks does not imply that he exists. For this point as well as an illuminating discussion of the inferential or performative linguistic structure of Descartes' argument overall, see Hintikka 1962.

7 Lacan 1965, pp. 864-65.

8 Descartes 1641, p. 25.

sense, on pain of asserting the necessary existence of that individual.[9] It is, rather, as Descartes may be read as suggesting, plausibly only the necessity of the reflexive "proposition" [*pronuntiatum*] *when it is uttered or conceived* that is here established. But this means that the claimed necessity of the conclusion of existence – the establishment of being that the cogito permits – passes essentially through the *activity* of its tokening in speech or (as Descartes supposes) in thought. But -- returning to the full formulation "ego cogito, ergo sum" (which Descartes does use, for instance in the *Principles of Philosophy* and (in French) in the *Discourse on the Method*) – this can only mean that the force of the "ergo" itself there depends essentially on the actual *existence* of the (token) reflexive signifiers that flank it.

It may be that, despite describing it as a "proposition," Descartes thinks of the "cogito, ergo sum" as, essentially, a kind of "inner" mental performance rather than anything requiring an explicit linguistic expression. If this is the case, though, the force of its purported demonstration does not generalize; even if it is possible for me to conclude, in my own interiority, from *my* thinking to *my* existence, it is not possible to draw from it any *general* conclusion about the being or nature of the subject. If, on the other hand, the demonstration of the *cogito* necessarily passes through the indexical linguistic signification that here articulates it means, this means that the support of the being that is to be established through or by the self-reflexive operation of thought can instead only amount to the quoted content of that thought itself, the "I am" together with its "therefore" as the signifier of a connective relationship actually missing in the real.

The point of this missing connection is that of the disequilibrium between knowledge and truth on which Lacan insists, the point at which, he goes on to argue, the "I" is thus called to establish itself in being. Taking up Freud's famous statement of the task of psychonalysis, "Wo Es war, soll Ich werden," Lacan offers, in order to point up the specific logic of the constitution of subjectivity he takes it to imply, the "retranslation" "Where it was, there must I come to be as a subject." In the context of the psychoanalyst's essential recognition of the fact of signification, the problem of the being of the ego *cogito* accordingly can be nothing other than the problem of the positional relationship, in language, of one indexical signifier to another, or of the basis for the self-identity induced or affirmed (but having no basis in external, referential fact) by this

9 For discussion, see Kaplan 1989 and Braun 2017. In Kaplan's "logic of demonstratives," it is possible for a thinker to know *a priori* the proposition *she would express* (in a particular context) as "I exist". But the proposition *thereby expressed* is nevertheless contingent, since it asserts the existence of a particular (contingently existing) individual.

repetition on the level of the requirement it adduces:

> Now this cause is what is covered (over) by the "soll Ich," the "must I" of Freud's formulation, which, in inverting its meaning [*sens*], brings forth the paradox of an imperative that presses me to assume [*assumer*] my own causality.[10]

In this respect, the psychoanalyst's radical recourse to the being of language, and thus to the necessity that the relationship between thinking and being that announces itself in the cogito be *signified*, has the effect of posing the problem of the subject's relation to knowledge as, alone, that of the kind of support it can gain from the interplay of signifiers in which it announces this relation.

What it means, then, that the *cogito* must be seen as "knotting itself in speech" is that the support of any possible knowledge that it grounds must be understood structurally, as having its proper unity (if anywhere) only in and through the effects of signifiers as such. These effects are moreover, as Lacan notes, to be separated radically and in the first instance from any assumption of their substantial reference, or the existent being of what is signified. For psychoanalysis, rather, the signifier is "defined ... as acting first of all as if it were separate from its signification," and it is only in the interplay between signifiers thus conceived that they have what can be characterized as their "meaning effects."[11] This conception of the primacy of the signifier with respect to any assumed referential being of what is signified, is the basis for Lacan's most typical articulation of the only meaning that the psychoanalytic reference to the "subject" can then have: that of what is "conveyed by a signifier in relation to another signifier."[12] Here, in other words, the "subject" is neither a substantial being nor a privileged realm of interiority, but rather "nothing other than what slides in a chain of signifiers, whether he knows which signifier he is the effect of or not."[13]

Nevertheless, the lack of positive ontological consistency that therefore characterizes any possible reference, in analytic discourse, for the *singulare tantum* "the subject" does not lead Lacan to reject the term's use there. Rather, it is from this position that Lacan articulates, for example in seminar XX, the distinctive way in which the "verbal

10 Lacan 1965, p. 865.

11 Lacan 1965, p. 875.

12 Lacan 1965, p. 875.

13 Lacan 1973, p. 50.

fiction" that is the referent of the "subject" comes to subsist, in default of a metalanguage, or "language of being" that would assure for it a secure place from which to anchor the totality of its knowledge of the real:

> I am going to say – that is my function – I am going to say once again – because I repeat myself – something that I say (*ce qui est de mon dire*), which is enunciated as follows, "There's no such thing as a metalanguage."
>
> When I say that, it apparently means – no language of being. But is there being? As I pointed out last time, what I say is what there isn't. Being is, as they say, and nonbeing is not. There is or there isn't. Being is merely presumed in certain words – 'individual,' for instance, and 'substance.' In my view, it is but a fact of what is said (*un fait de dit*).
>
> The word 'subject' that I use thus takes on a different import.
>
> I distinguish myself from the language of being. That implies that there may be verbal fiction (*fiction de mot*) – I mean, fiction on the basis of the word ...
>
> This is where I arrive at the meaning of the word 'subject' in analytic discourse. What speaks without knowing it makes me 'I,' subject of the verb. That doesn't suffice to bring me into being. That has nothing to do with what I am forced to put in being (*mettre dans l'être*) – enough knowledge for it to hold up, but not one drop more ...
>
> The 'I' is not a being, but rather something attributed to [or presumed in] that which speaks.[14]

In default of any substantial or individual being of its own, the "I" here takes on the significance of that which is presupposed or attributed as the positional support in language of the being that speaks. This does not suffice, as Lacan emphasizes, to establish any stable anchoring of this being in the real, from which it could formulate a position of the secure grounding of knowledge. But it does show how its peculiar mode of subsistence – that of "what speaks without knowing it" – comes to insert itself in the essential gap between being and knowledge that thereby opens up.

14 Lacan 1973, pp. 118-120.

II

In his 2002 article "Russell, Wittgenstein, and *cogito, ergo sum*," Antony Flew relates the telling anecdote of Wittgenstein's scheduled response, at a 1947 meeting of the Jowett society in Oxford, to a paper by Oscar Wood on the topic:

> I cannot now recall what if anything Wittgenstein said in the response that he was scheduled to make to Oscar Wood's paper on "*Cogito ergo sum*," except that any remarks he did make at that stage certainly contained no reference whatever to that paper. Understandably exasperated by Wittgenstein's failure to address what had been widely publicized as the topic of the meeting, Professor H.A. ... Prichard – as his and the first contribution to the ensuing discussion – wanted to know what "Herr Wittgenstein" had to say about *Cogito ergo sum*. Wittgenstein's response was to say, "*Cogito ergo sum.* That's a very peculiar sentence," pointing to his own head as he uttered the two words "cogito" and "sum."[15]

Flew takes Wittgenstein's gesture to formulate a materialist objection to Descartes' dualism, operating by reminding the audience of the (purportedly undoubted) physicality of the referent of the first-person pronoun in intersubjective discourse:

> At the time this seemed to me, as it clearly seemed to Prichard, to be nothing more than a perverse but no doubt entirely characteristic way of refusing to meet Prichard's modestly reasonable request for relevant comment. It was only later that I realized that, by thus reminding his audience that the referents of the token-reflexive word "I" are the flesh and blood people who utter it to refer to themselves, Wittgenstein might have been suggesting a radical and totally devastating objection to the position that Descartes had reached in the second paragraph of Part IV of his *Discourse on the Method*. For it is simply false to maintain that the referent of the word is an incorporeal and yet substantial subject of consciousness. It is, on the contrary, a flesh and blood human being.[16]

In the paragraph of the *Discourse* mentioned by Flew, Descartes concludes from the fact that he thinks, in doubting, that he is a "substance whose whole essence or nature is simply to think" and, thereby, to the further conclusion of the complete distinction of "this 'I' – that is, the soul by which I am what I am" from the body.[17] Against this, as Flew suggests, Wittgenstein's gesture on the occasion may be seen as exposing what amounts, in Descartes' text, to the unargued reification of a substantial nominal referent for what rather functions, in public discourse, as the first-person reflexive pronoun. Whereas Descartes thereby purports to find in the activity of thinking the substantial support of the identity of the subject as thinking soul, attention to the actual linguistic functioning of the token-reflexive "I" then has, by contrast, the effect of reminding us that its ordinary use is to point to "the flesh and blood people who utter it" and, further, that there can be, in this ordinary use, no question of its picking out a hidden thinking substance.

On this interpretation, Wittgenstein's gesture has the significant merit of evincing the essential connection of the functioning of indexical self-reference, in ordinary intersubjective discourse, to the spatiotemporal location -- and hence the materiality -- of its objects. However, we move closer to an illuminating interpretation of the way Wittgenstein's gesture might be thought to indicate positively as well something of the relationship of being and knowledge that this implies by adding to it the relevant consideration that Flew's "flesh and blood people" are – whatever the consequences of the materiality of their embodiment – also, and essentially, beings that *speak*. As such they find themselves, if anywhere, only in the *nexus* of the signifier. It is here they must find any support they derive for their being as knowers. As such they are themselves essentially subject, in particular, to what Lacan understands as the materiality of the signifier, from which they must then derive whatever support they may find, in thinking, for their being as knowers. Of course, it is only *as* beings that speak that they are capable of "self"-reference, or of "token-reflexive" self-signification at all. Wittgenstein's repetition of the indexical "I" together with the gesture of self-indication then does not simply have the significance of reminding the audience of a fact about the materiality of the ordinary referents of this expression, but rather, and more radically, of the specifc kind of sustenance that the apparent substantiality of this reference derives from its constitutive relationship to language itself, wherein speaking beings come to exist as such.

In fact, here Wittgenstein stages, quite literally, the only kind of subsistence that "the subject" may reasonably be understood to have, as existing in the sliding between pure signifiers, separated entirely from any assumption of signification, which Lacan suggests. If it is evident,

15 Flew 2002, p. 66.

16 Flew 2002, pp. 66-67.

17 Descartes 1637, pp. 32-33.

from Wittgenstein's gesture, that the referent of the indexical is not some immaterial or otherwise interior entity, it is equally evident that the repetition of the reflexive gesture here does not establish anything but its own repeatability: that of the (presumed or presupposed) identity over time of the position from which self-reference takes place. But, just as clearly, the connection that is purported or assumed to exist in the "*ergo*" of the *cogito ergo sum*, thereby grounding this identity as privileged point of knowledge, is lacking in the real: between the reflexive performance and the point of being that it is supposed to ground there is no real connection, no substantial underlying unity or identity beyond that assumed by the positional attribution of the "I" itself.

That this support is not sufficiently established simply by affirming or stipulating the materiality of any referent of "I" in intersubjective discourse is further shown by the consideration that indexical or demonstrative reference to an ordinary material object, even if repeated, does not even have the appearance of establishing a point in reality from which truths can be known.[18] Seen, rather, not simply as the assertion of a presumptive materialism but rather as calling attention to the essentiality of the support for a possible knowing that the subject draws from language, the effect of Wittgenstein's repetition of the "I", along with the reflexive gesture of self-demonstration, can rather be seen as that of illuminating how the being that speaks must find in language the cause of its being, as well as how it thereby essentially misses there any substantial being of this sought cause.

Seen in this way, what is most decisive about Wittgenstein's gesture is not that the reflexive "I" can be repeated over time, in each case having a referent which is in fact a unitary spatiotemporally located one. It is rather that the substantial unity which here appears to underlie the identity of the reference across the two cases is nowhere itself to be found as an object of indexical (or any other kind of) reference; it is this absent cause of being which is rather expressed here by the "ergo," which itself lacks any demonstrative or indexical correlate. But if, in the "cogito, ergo sum," the "ergo" thus lacks the reference of any substantial or connective being that would act as support for the unity of the subject thus announced, then the positive structure of the *ego cogito* must, rather, be thought as supported essentially, and only, by the gap between the two repetitions of the linguistic "I" themselves. As Wittgenstein's gesture points up, these two instances have the effect of adverting to a movement proposed to be made from the self-reference of thought to that of being;

18 Thus, in general, the inference from "*this* φ's" to "*this* exists" may be taken as valid, at least when both tokenings of "this" are accompanied by a demonstrative gesture toward the same individual; but the inference does not in general even appear to establish anything about knowledge.

but what corresponds to each in reality can only be the empty form of linguistic self-reference itself.

What kind of position for a "subject," is, then, thus sustained in language for the being that speaks? At *PI* 306, Wittgenstein responds to the interlocutor's charge of the eliminativist behaviorism that may seem to be implicated by his questioning about the being of inner and mental "processes" with a carefully measured dialectical formulation indicating, as well, the positive linguistic locus of the position from which this being is sustained:

> "Aren't you nevertheless a behaviourist in disguise? Aren't you nevertheless basically saying that everything except human behavior is a fiction?" -- If I speak of a fiction, then it is of a *grammatical* fiction.

Here, studiously avoiding any reference to a "subject" or its being, Wittgenstein nevertheless indicates, in terms that directly evoke Lacan's own reference to "linguistic fictions," the kind of support that the referent of the "I" may reasonably be thought to derive from the being of language which is its source. This is not, as we have seen, the support of substance, nor even of the unity of what we can thereby take to be an entity enduring over time. It is, rather, the suppositional or presumptive being of that which has, in its articulation, the structure of a *linguistic* or *grammatical* fiction: that which comes to subsist on the basis of its assumption in language at the structural point where it – language itself -- necessarily invokes the fantasy of the total support of its own global position of knowing. The staging of this imaginary support as that of the interiority of a domain of the "private" then articulates it as that of the indefeasible truth of the being of the subjective, of the immediacy or privileged self-presence of "inner" contents and experiences that cannot be doubted because of the priority with which they are known.

Without according to this interiority any status other than a fictional one, how can we better understand its structure? It is in response to this question that we might usefully understand the later Wittgenstein's carefully dialectical response to the position that finds in a purported indefeasibly certain self-knowledge the essential support of the "privacy" of the subjective:

> 246. In what sense are my sensations *private*? -- Well, only I can know whether I am really in pain; another person can only surmise it. – In one way this is false, and in another nonsense. If we are using the word "know" as it is normally used (and how else are we

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to use it?), then other people very often know if I'm in pain. –Yes, but all the same, not with the certainty with which I know it myself! – It can't be said of me at all (except perhaps as a joke) that I *know* I'm in pain. What is it supposed to mean – except perhaps that I *am* in pain?

Other people cannot be said to learn of my sensations *only* from my behavior – for I cannot be said to learn of them. I *have* them.

This much is true: it makes sense to say about other people that they doubt whether I am in pain; but not to say it about myself.[19]

Here, the interlocutory voice that aims to establish the being of the subject as the specialized "private" domain of its knowledge yields to the linguistic or grammatical reminder of the sense of knowledge itself, in its defining relation to the possibilities of its articulation and contestation. The effect of the reminder is to maintain, what is surely correct, that there is no signification of the subject's interiority to establish the truth of its being that does not also expose it to the possible contestation of that truth as expressed, at least if it does more than just to affirm the empty "I am". This is not to say that Wittgenstein denies the force or validity of the particular operation by which Descartes himself articulates what he takes as the positive basis of this securing, namely the consideration of the asymmetry of the possibility of doubt between the positions from which I make reference to another and to myself. But the effect of the remark is to show how such as subject can only maintain this self-reference in the default of the substantiality of the positive self-knowing supposed, by Descartes, to be established thereby.

In particular, the effects for the constitution of the position of the being presumed to know of what may be described in Lacanian terms as its constitutive subjection to the signifier are staged radically when, developing the skein of considerations in the *Philosophical Investigations* typically termed the "Private Language Argument," Wittgenstein considers the case of a diarist who wishes to chronicle the recurrence of a certain sensation:

> To this end I associate it with the sign "S" and write this sign in a calendar for every day on which I have the sensation.[20]

In the dialogue that ensues, the claims of the interlocutor to establish an identical referent for the "S" in the repetition of its inscription are

19 Wittgenstein 1951, section 246.

20 Wittgenstein 1951, section 258.

repeatedly and effectively challenged by Wittgenstein's posing of the problem of the sustenance of the relationship in which the reference of the sign to its identical object is supposed to consist. First, evidently, "a definition of the sign cannot be formulated:" it is clearly impossible, in other words, to present the sign along with its referent on the unitary plane of reference that its linguistic definition would require, given that the referent is here conceived as "private" and essentially "inner".[21] Next, the interlocutor proposes that one might be able nevertheless to give a "kind" of ostensive definition of the sign to oneself, not by means of pointing in the ordinary sense but by means of the "inward" pointing achieved by a direction of one's attention to the sensation. However, it is obscure, as Wittgenstein points out, what this direction of attention suffices to achieve: if its point is to "fix" or "lay down" the meaning of the sign, the interlocutor can only suppose that it does so by allowing the connection between the sign and the sensation to be "committed to memory." But:

> ..."I commit it to memory" can only mean: this process brings it about that I remember the connection *correctly* in the future. But in the present case, I have no criterion of correctness. One would like to say: whatever is going to seem correct to me is correct. And that only means we can't talk about 'correct'.[22]

Again, at *PI* 260, the interlocutor insists, appealing once more to the force of her own conviction as felt: "Well, I *believe* that this is the sensation S again." The deflationary response comes swiftly: "Perhaps you *believe* that you believe it!" Here, beyond the obvious and immediate force of the riposte to the interlocutor who, having staked her position on the assuredness of the justified truth of the subjective, is constrained to retreat to mere belief, Wittgenstein also invokes the essentially quotational structure of the contents of thought itself: whether it is a matter of knowledge *or* belief, the subjective self-relation sought in what is supposed to be self-evidently the same can only be expressed as one's regular connection to the propositional *content*: "THIS is the sensation S again."[23] However, besides involving essentially the indexical "this," whose "inner" functioning is of course far from assured, the quotational

21 Wittgenstein 1951, section 258.

22 Wittgenstein 1951, section 258.

23 Cf. *PI* 263: "Surely I can (inwardly) resolve to call THIS 'pain' in the future." – "But is it certain that you have resolved this? Are you sure that it was enough for this purpose to concentrate your attention on your feeling?" – An odd question. –

form itself *requires* the stable reference of the name "S" across instances of it use, and thus can by no means be thought to *establish* it. Thus the interlocutor's claim to *establish* the stable basis for the repetition of the "S" in the "inner" place of the subject's truth is exposed as idle. The signifier's possibility of repetition is not enough to establish an identical being; nor does it even appear, once exposed to the necessary form of its linguistic quotation, to produce the self-presentational indefeasibility that the "Cartesian" position claims for its reference. On the other hand, though, what – and here is to be found the proper being of the "grammatical fiction" of interiority that it sustains – the possibility of the repetition of the signifier *does* indicate is the proper place of the reference made to "sensations" in the regular course of the life of the being that speaks. This is not the place accorded to it by the (would-be) "private" diarist, which is rather that of the mere noting of the presumed presence of an item supposed to recur in a privileged domain. But it is nevertheless the presuppositional or suppositional place from which we maintain and articulate, as beings that think, speak, and feel, the claims of our desires and the expressions of our wishes, thoughts, and pains.

With this observation, we are in a position to understand that, instead of (as is usually thought) here rejecting the being of sensations and of the "inner," on the verificationist or criteriological grounds of a presumptive assumption of the essential "publicity" of language, Wittgenstein is, rather, formulating the radical implication of their essential subjection to the form of the signifier itself, from which, alone, they gain their sustenance in being. Of course, this has the implication that the subject's thinking alone, and the operations of which it is capable, do not suffice to establish a point for itself in being, and still less its own identity over time. Instead, the sustenance of this presumed or maintained identity must be found, if anywhere, in the very materiality of the signifier and its own evident capacity to be repeated as the same. This is not the "truth" of the subject in the sense of establishing for "it" a cause of its being, unless this being be nothing other than that of the repeatability of language itself, or the "meaning effect" of the diachronic relation of two temporally distinct indexical tokens of self-reference in ordinary discourse. It is, however, nevertheless the essential support of the kind of 'inner life' that a being who speaks can have, and of the kind of self-knowledge of which it is capable.

III

In his Seminar XVII of 1969-70, in the midst of a discussion of the relationship of truth and *jouissance*, Lacan affirms that, for the analyst's investigation of it, "truth" cannot have any meaning other than that which it attains in propositional logic, where it is treated in particular simply as one of the two truth-values, and its handling is reduced to the marking of certain propositions with its mark (typically the symbol 'T'). "This usage," Lacan says, "is most particularly bereft of hope," but this hopelessness is also, he suggests, exactly "what is salubrious about it."[24] It is in illustration of the radical consequences of this treatment that he then refers to Wittgenstein as:

> ...the author who has given the most forceful formulation to what results from the enterprise of proposing that the only truth there is is inscribed in a proposition, and from articulating that which, in knowledge as such – knowledge being constituted on the basis of propositions – can in all strictness function as truth.[25]

In the proposal, with which Lacan certainly agrees, he finds, in particular, the adequate formulation of the strict constraint which he (Lacan) elsewhere puts on the kind of structural knowledge of which the analyst's discourse is, alone, capable: that which can be captured by means of symbolic and mathematical formalization, emerging at the demonstrative point of the necessary impasse of its ambition consistently to capture the whole.[26] For the Wittgenstein of the *Tracatus Logcio-Philosophicus*, as Lacan reads him, in particular, "nothing can be said to be true other than agreement with a structure which I will not even situate ... as logical, but, and [Wittgenstein] puts this well, as grammatical."[27] In the *Tractatus*, the truth of propositions – here, the only truth that there is – is structured grammatically in accordance with the logical/grammatical form of the world, and the world, understood as "all that is the case", is itself just the correlate of a composite proposition comprising the totality

24 Lacan 1970, p. 62.

25 Lacan 1970, p. 66.

26 E.g.: "The real can only be inscribed on the basis of an impasse of formalization. That is why I thought I could provide a model of it using mathematical formalization, inasmuch as it is the most advanced elaboration we have by which to produce signifierness. The mathematical formalization of signifierness runs counter to meaning – I almost said "*à contre-sens*." (Lacan 1973, pp. 85-86).

27 Lacan 1970, p. 66.

of propositional truths.[28] All that can then be said about this structure, as Lacan notes, is tautologous, having the empty form of, for example, the assertion that "whatever you state is either true or false."[29] In this respect, as Wittgenstein concludes at the end of the book, everything that can be said of grammatical structure, the form of the world, is strictly speaking nonsense [*Unsinn*], and the "long circuit" of the *Tractatus'* own statements will only, if successful, have the effect of allowing the reader to conclude that that, everything having been said about the structure of truth, there is nothing further to say; but also that all that has been said *about* the structure of truth itself lacks sense.[30]

Furthermore, if there is no truth but the truth of propositions, one cannot suppose alongside this truth another stratum or variety of truth caused or induced by the *existence* of anything whatsoever: no *object* or entity, whether in its presence or in its appearance, can by itself ground the saying of any truth. This is, as Lacan notes, sufficiently established in the context of the *Tractatus* by the claim of proposition 4.21: that "The simplest kind of proposition, an elementary proposition, asserts the existence of a state of affairs."[31] Given, in particular, that the world is, for Wittgenstein, entirely structured and supported as the complex structure of states of affairs which are themselves understood as simple objects in direct combination, this implies that there are no things in the world "but that are inaccessible": no things that can be described, named or otherwise articulated, except insofar as they are supported by the logical-grammatical structure of the proposition itself.[32]

In particular, as Wittgenstein states at 3.221:

> Objects can only be *named.* Signs are their representatives. I can only speak *about* them: I cannot *put them into words* [*sie aussprechen kann ich nicht*]. Propositions can only say *how* things are, not *what* they are.

As Lacan suggests in concluding the discussion of Wittgenstein in seminar XVII, that there is only propositional truth, and that there accordingly no truth of objects alone, has the further consequence that there is no cause of truth outside what is captured in deductive

28 Wittgenstein 1921 (henceforth: *TLP*), 1-1.12.

29 Lacan 1970, p. 67.

30 Lacan 1970, p. 67; *TLP* 6.53-7.

31 Lacan 1970, p. 67; *TLP* 4.21.

32 Lacan 1970, p. 68.

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implication as its inferential preservation:

> There is no more certain light under which what results from what logicians have always articulated appears, if only to dazzle us with the air of paradox contained in what has been called material implication... if...we reject that the true entail the false, that it can have a false consequent – for this is what we are rejecting, in the absence of which there would be no possible articulation of propositional logic – we end up with this curious fact that the true has a genealogy, that it always goes back to an initial true, from which it is no longer able to fall.
>
> This is such a strange indication, one that is so challenged by our entire life, I mean our life as a subject, that this alone would be sufficient to question whether truth could in any way be isolated as an attribute – as an attribute of anything capable of articulating with knowledge.[33]

If one agrees, as Lacan does on behalf of the analyst's discourse, with Wittgenstein's constraint of truth to the propositional, one can only draw the conclusion that its articulation is itself wholly structured by the deductive relationships of propositions. Once the initial, elementary propositions are fixed, there can be truth only as the inferential deduction of further propositions from these. There can, then, be no *object* that is the cause of truth, and it accordingly becomes at least doubtful whether there can be anything like a *subject* whose positive knowledge is marked by any distinctive relation to it.

Indeed, if truth can only be propositional, where does this leave the supposition of a "subject of knowledge" itself? At 5.541-5.5421, Wittgenstein considers the logical form of propositions including verbs of intentionality, including "certain forms of proposition in psychology, such as 'A believes that p is the case' and 'A has the thought p", etc. Propositions of these forms, as Wittgenstein notes, have on their face the peculiarity of appearing to relate what is grammatically an object – the bearer of the name 'A' – to an embedded proposition, thereby seeming to allow the latter to figure in the former in a non-truth-functional way. However, owing to the logical independence of simple propositions, which itself has its basis in the insistence of 4.21 that the simplest truth-evaluable propositions are those asserting the existence of states of affairs (rather than objects), it is impossible for a proposition to appear

33 Lacan 1970, p. 69.

significantly in another one, unless they are connected truth-functionally.[34]

This leads Wittgenstein to conclude that the superficial form of (e.g.) '*A* believes that *p*', '*A* has the thought *p*', and '*A* says *p*' is here misleading: propositions appearing to exhibit this form, and indeed propositions involving what Russell misleadingly called "propositional attitudes" generally, are in fact of the merely disquotational form '"*p*" says *p*'. This form does not involve the correlation of a fact with an object, but rather only "the correlation of facts by means of the correlation of their objects:" in particular, the apparent form of relation of a subject to a proposition is here replaced with the correlation of two facts with as shared logical form which results from the representational relationship of the individual signs of the first with the objects of the second.[35] Given the *Tractatus*' constraint of truth to the nexus of the proposition, it is in this primitive correlative relationship that, alone, the "objective" cause of the truth of propositions can consist. But the least that can be said about this primitive relationship between names and their objects is that, given the radical distinction between names and propositions, there can be no truth of it, and certainly none that a subject can establish and maintain.

Indeed, from this Wittgenstein draws the general and striking conclusions that:

> 5.5421. This shows too that there is no such thing as the soul – the subject, etc. – as it is conceived in the superficial psychology of the present day.

and

> 5.631 There is no such thing as the subject that thinks or entertains ideas.

Given the *Tractatus*' limitation of truth to the propositional and the structuralist form of inference to which it thereby constrains it, there is, then, nowhere in the world a "subject of knowledge": nowhere in the world, that is, a subject who stands in such a relation to truth in general as to be able to locate itself with respect to it, or to find anywhere within it the privileged point of its own being as knower. But if the propositional

34 *TLP* 5.54.

35 *TLP* 5.542. As, for instance, if, rather than ascribing to *A* the belief that "the cat is on the mat," one imagines a token of the sentence "the cat is on the mat" literally inscribed in *A*'s brain: the tokening is itself a fact (TLP 2.141; 3.143-3.1432) composed of individual objects – its terms – some of which are in representational relationships to the objects which comprise the fact of the cat's actually being on the mat.

structure of truth thus suffices to establish the non-existence of a subjective cause or bearer of knowledge in the world, for the Wittgenstein of the *Tractatus* there is, nevertheless, left over as a kind of *residuum* the "metaphysical" subject: although nowhere to be found in the world, it is nevertheless correlative with the world as a whole and as such, and identified with its limit.[36] The claim that there is such a subject is motivated, in the Tractatus, by the "truth of solipsism" that one might attempt to express as the reflexive claim that "the world is *my* world": but as Wittgenstein notes, the attempt to express this "truth" immediately miscarries, victim to the avowed nonsensicality of *all* propositions beyond those asserting empirical truths.[37] If this "metaphysical" subject is construed, in default of an objective position of knowledge *within* the world, as nevertheless possessing a point of knowledge, grounded in the correlation between signs and objects that establishes the possibility of language in the real, this point is nevertheless radically inexpressible. And if it can be said that it founds the correlation of signs to their (simple) objects it does so from a mystical position that itself cannot be founded in the real, on pain of declaring it contradictory.

Here, we apparently then return to Lacan's antinomic subject of the signifier, formally correlative not to the totality of the world but to the gap between knowledge and truth that emerges from its necessary incompleteness. The grammatical structure here remains such as to exclude any possible non-contradictory "truth of the subject" as cause of its being. If, in other words, the early Wittgenstein will have drawn the radical consequences for a "subject position" of the propositional form of knowledge of the whole, he will have done so only at the significant cost of the invocation of an undefinable and unsayable point of contact in the real. Given the *Tractatus*' recognition of the grammatical structure of the world, the "position" of the subject is then that of, as Lacan says, "some relation of being that cannot be known" or even spoken of. But this does not mean, as Lacan himself suggests, that the only possible response to this recognition is the austere silence that the *Tractatus* famously concludes by recommending or prescribing. At any rate, as he suggests in distinguishing the discourse of the analyst from what he calls the "psychotic ferocity" of the early Wittgenstein's own discourse, it may be possible to recognize the inseparability of truth from the effects of language while nevertheless affirming, as Lacan constantly does, some possibility of the articulation, outside all propositions, of that unknown relation which places the being that speaks in the *locus*

36 *TLP* 5.632, 5.633.

37 *TLP* 5.62.

of the (incomplete) totality of language itself.[38] That this totality must be incomplete means that this relation cannot correspond to that of a subject to its objects within the world, and that any stability it might be thought to have is instead revealed as the mirage of its necessary misrecognition of itself there. But if there is, on the other hand, a way of articulating this obscure relation to being, in default of knowledge, it can then itself apparently have no form but that of our relation to the paradoxical ground that the later Wittgenstein himself appears to gesture toward when he invokes, cautiously and without positive definition, what he calls the "given" of the structure of our language, as we find ourselves in our own imagination of it, our "form of life."[39] It must be admitted that, while this indication notably parallels Lacan's own in invoking the value of "form" at the point of the figuration of the absent cause of the subject's linguistic being, the suggestion of parallelism is not verified by any obvious correspondence of the demonstrative or theoretical methods called upon to verify its functioning there in each case. Nevertheless, if the connection is instead situated at the level of the shared therapeutic ambition that crucially motivates both projects' engagements with the life of the being that speaks, it may be possible to glimpse in them the outlines of a common positive figure of a linguistic life reconciled to the movement of desire that the vanishing of this cause implies.

Bibliography

Braun, David 2017, "Indexicals", *The Stanford Encyclopedia of Philosophy* (Summer 2017 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/sum2017/entries/indexicals/>.

Descartes, René 1637, *Discourse on The Method of Rightly Conducting One's Reason and Seeking the Truth in the Sciences*. Translated by Robert Stoothoff. In *The Philosophical Writings of Descartes*, Vol. 1. Cambridge: Cambridge U. Press, 1985.

---- 1641, *Meditations on First Philosophy*. Translated by Donald A. Cress. In *Discourse on Method and Meditations on First Philosophy*, Fourth Edition. Indianapolis: Hackett, 1998.

Flew, Antony 2002, 'Russell, Wittgenstein, and *Cogito ergo sum*,' in *Bertrand Russell on Nuclear War, Peace, and Language: Critical and Historical Essays*. Westport, Connecticut: Praeger.

Hintikka, J. 1962, 'Cogito Ergo Sum: Inference or Performance?' *The Philosophical Review* 71:1 (Jan. 1962), 3-32.

Kaplan, David, 1989, 'Demonstratives,' Almog, J., Perry, J. and Wettstein, H., 1989. *Themes from Kaplan*, Oxford: Oxford University Press, pp. 481–563.

Lacan, Jacques 1965, 'Science and Truth', in *Ecrits: The First Complete Edition in English.* Translated by Bruce Fink. New York: Norton, 2006.

---- 1970, *The Other Side of Psychoanalysis: The Seminar of Jacques Lacan, Book XVII*. Translated by Russell Grigg. New York: Norton, 2007.

---- 1973, *On Feminine Sexuality: The Limits of Love and Knowledge: The Seminar of Jacques Lacan, Book XX*. Translated with notes by Bruce Fink. New York: Norton, 1998.

Wittgenstein, Ludwig 1921, *Tractatus Logico-Philosophicus*. Translated by D. F. Pears and B. F. McGuinness. London: Routledge, 1988.

---- 1953, *Philosophical Investigations*. German text with English translation by G. E. M. Anscombe, P. M. S. Hacker and Joachim Schulte. Revised 4th edition. Blackwell, 2009.

38 "As for the analytic operation, it is distinguished by advancing into this field in a way that is distinct from what is, I would say, found embodied in Wittgenstein's discourse, that is, a psychotic ferocity, in comparison with which Ockham's well-known razor, which states that we must admit only notions that are necessary, is nothing ...
Truth – we begin again from first principles – is certainly inseparable from the effects of language taken as such.
No truth can be localized except in the field in which it is stated – in which it is stated as best it can.
Therefore, it is true that there is no true without the false, at least not in principle. This is true.
But that there is no false without the true, that is false.
I mean that the true can only be found outside all propositions. To say that the true is inseparable from the effects of language, considered as such, is to include the unconscious within them." (Lacan 1970, p. 70)

39 "What has to be accepted, the given, is – one might say – *forms of life.*" (Wittgenstein 1951, p. 238) "...And to imagine a language means to imagine a form of life." (Wittgenstein 1951, sect. 19).

Science, Philosophy, Literature[1]

Pierre Macherey

Abstract: The aim of this article is to clarify, in the case of France, the unique nature of the relationship between philosophy and literature, particularly in light of the introduction of these two activities in the context of educational institutions.

Keywords: Barthes, philosophy, literature, knowledge, science

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In his inaugural lecture at the *Collége de France*, Roland Barthes defined literature by referring to three "forces" designated by the concepts *mathesis*, *mimesis*, and *semiosis*.[2] And, in order to characterise, what, from literature, falls under a *mathesis*, he argued both that "literature accommodates many kinds of knowledge" and that "literature works in the interstices of science."[3]This was tantamount to saying that the relation of literature to knowledge, a relation which perhaps draws its strength from being divergently and inconsistently connected, is not a straightforward relation, but flawed:

> literature [...] displaces the various kinds of knowledge, does not fix or fetishize any of them; it gives them an indirect place, and this indirection is precious. [...] Because it *stages* language instead of simply using it, literature feeds knowledge into the machinery of infinite reflexivity. Through writing, knowledge ceaselessly reflects on knowledge, in terms of a discourse which is no longer epistemological, but dramatic.[4]

It seems that, through this practice of staging, or textual situatedness, rather than reflecting on knowledge, literature, as Barthes says, makes knowledge "reflect on knowledge." Knowledge itself reflects on knowledge: of those rays that are caught, some are returned by virtue of a selection process that remains mysterious, and which is perhaps arbitrary in the sense that the rules of a game are arbitrary, so as to give, or rather to show, to exhibit, a certain idea of knowledge. Thus, according to Barthes, knowledge, as the production of utterances, is inserted and relaunched into an enunciating dynamic: and it is this, which, in a certain

1 This text was first published in Textuel n. 37 ("Où en est la théorie littéraire?"), Revue de l'UFR de Lettres de L'Université Paris-VII, 2000, p.133-142

2 Barthes 1979, p. 6

3 Ibid. pp. 6-7

4 ibid. pp. 6-7

way, is situated at a distance from itself that grants it the means for its paradoxical reflection.

This conceptualisation of literature, as a reflection of knowledge, raises the following question: is literature that which produces this reflection or is it the product of it? In the first hypothesis, knowledge is thought [*est réfléchi*] by literature, which remains outside of itself, whereas, in the second, knowledge thinks itself [*se réfléchit*] in literature. As a result, it is situated as both its outside and its limit; which would then be the non-knowledge, or the meta-knowledge of this knowledge. Let us pose this question in a more general way: taking into account its relation to reflection which links it to knowledge, does literature preserve its autonomy with respect to knowledge? Or is it doomed to heteronomy, being itself then nothing other than the heteronomy of knowledge? That is to say, that necessity that projects an interiority attributed to discourses of knowledge in the form of an exteriority, by simply offering a different reading, and by showing in this way the exteriority that haunts their alleged interiority? Well, it is clear that this question has little chance of being settled, nor even to begin to be explored until the notion of "discourses of knowledge" has been clarified, this being the condition for understanding how this type of discourse is thought within, or by, this other type of discourse that would take place in literary texts.

In the expression "discourse of knowledge," knowledge can be understood both in the sense of the sciences and of theory or, if you like, of philosophy, depending on whether there is a knowledge of something, relative to determinable conditions. Or, if there is, in the absolute, a Knowledge, whose form, strictly speaking, has only itself as the object, which amounts to situating it on a horizon of infinite generality. Why does a single word, that of "knowledge," refer simultaneously to these two meanings? Because, while consisting of two different meanings and not one and the same sense, these never emerge independently of each other, but form a loop. The distinctive feature of scientific-knowledges, along with their objects, cannot be given without the generality of knowledge-theory, which itself is without object insofar as it takes itself for object, and vice versa. Thus, the intransivity of pure knowledge must always be combined with the transitivity of special knowledges which they themselves call for. This explains the privileged relation that philosophy, from its inception, maintains with the sciences: in the same vein, it appears rather absurd that today, in our neck of the woods, it is taught as a "literary" discipline.

Building on from this previous remark, let us ask in what sense, then,

would it be possible to speak of "literary philosophy." In reference to the state of affairs just mentioned, this expression would refer to a practice of philosophy leaning towards the literary form of discourse, and favourably so; electing it as an exclusive normative reference. In this case, the notion of literary philosophy is to be understood as an alternative to other conceptions of philosophy, such as that understood for instance under the heading of "scientific philosophy." And it seems that the debate that has taken place in recent decades between "continental philosophy" and "non-continental philosophy" has partly been fought on this terrain. Depending on whether it looks for its models on the side of literature or that of knowledge, philosophy would turn towards different, even radically separate, forms of speculation and concerns, in relation to other approaches to the general problems of thought. From this perspective, a philosophy would be 'literary' insofar as it would be distinguished from other approaches connoted as non-literary, who do not pose philosophical questions from their field as such.

On this point, one must be clear: philosophy, in this sense, is structurally integrated literary studies in contemporary French society. This, since it defines its own position within the disciplinary separation between the "literary" and the "scientific." The two great divergent networks that traverse our educational system are constituted on this basis, the decisive moment of which was the implementation under the Second Empire of what was then called the "bifurcation." We can say that, when philosophy began to be included in the French public education system during the last years of the eighteenth century - with the exception of the atypical experience of the *écoles centrales* who were assigned to what was then called "Ideology," an interim hybrid function between grammar and the natural sciences – the terrain in which philosophy preferentially situated itself, so as to assert its exclusivity or at least to exert on it a kind of sovereignty, has been that of the study of rhetoric and the classical humanities. The claim of dogmatic spiritualists of the University, led by V. Cousin, to inaugurate a "science of the mind" built around the fiction of "spiritual facts," a science whose form was that of a psychology and not that of a logic or theory of knowledge, has merely provoked a caricature of the scientific practice. For the activity, and the culture, of professional philosophers, obsessed in the first instance by political preoccupations and by their great conflict with the Catholic church, remained predominantly marked by references borrowed from the field of the "Arts," in which was included the History of philosophy, and not that of the Sciences. It is what enables us to understand the virulence of the debate initiated by Durkheim at the end of the nineteenth century, in his accounts

on the teaching of philosophy. A debate that continues today around the question of the "human sciences," and their vocation or capacity to re-orient the work of philosophy in the direction of a more objective treatment of the problems of the human world with which it deals in a privileged way. Other aspects of reality become the exclusive domain of the specialised sciences whose treatment is assumed to be positive.

Therefore, we can say that from the perspective of the introduction of philosophy in France, philosophy, in so far as it defines itself by the position to which it has been assigned, or that it assumes within the educational system, leans favourably on the side of literature. In any case, this is how it is perceived from the perspective of other national traditions, for whom this assimilation of philosophy as a literary "subject" may not appear so self-evident. In no way does this dominant trend preclude it from being met with internal resistance, the effects of which are more or less obvious. This explains the divergence, throughout the nineteenth century, between the two great traditions: that of the philosophers from the literary section of the Ecole Normale, and that of the philosophers graduating from the Ecole Polytechnique, with their two leaders, Victor Cousin and Auguste Comte. The latter has no doubt failed in his effort to promote "scientific" philosophy, or at the very least based on a scientific culture, but whose final orientations have taken a more political, and an especially moral, turn. While the former has done rather well in his endeavour, organising a curriculum for philosophy and situating it as an extension of the study of the humanities, to which it supposedly gives its crowning achievement. A hundred and fifty years later, this plan still largely functions, the "class of philosophy," taken by those in the Literature section of their final year of High School, constitutes its survival.

Perhaps it would be possible, nevertheless, to take the expression "literary philosophy" in an entirely different sense. By rupturing with an institutional conception of philosophy, defined exclusively by the privileged bond it maintains with literary subjects or disciplines, and thus is situated in opposition to a philosophy of the scientific type, one can imagine a practice of philosophy that integrates literary questions into its field of thought. In this way, literature would no longer be an object over which philosophy simply reflects, as its universal vocation propels it to do with regards to any other type of object (logical forms, numbers, matter, life, law, society, religion, art, etc.), but it would represent a form of thought not entirely foreign to philosophical reflection, and may even serve as a reference for it. In other words, the idea of a literary nature of philosophy being disqualified would render possible a literary interest in philosophy;

in the dual meaning of an interest as both an interest of literature for philosophy, and an interest of philosophy for literature.

So let us ask the following brutal question: what if the opposition between literature and science, which controls most of the choices to which the programmes of our educational network condemns its users, was partly artificial? Or at least only presented one aspect of the institutional character, without any referent being able to be objectively found on the side of the very things that are supposed to be concerned by these categories, "literature" and "science"?

It seems that this question was asked at the very beginning of the history of philosophy itself, by Plato, who, in the dialectical form of dialogue, wanted to maintain both ends of this chain, reconciling the art of literary storytelling and the demonstrative or argumentative practice of scientific discussion, without ever giving preference to one at the detriment of the other. From there emerged this astonishing revelation: the true man of letters is perhaps the philosopher, from which the proper practice of the philosopher creates a new type of literature. Obsessed by the question of his relation to the truth, he situates himself as an alternative to the other literature, that of poets like Homer or Hesiod, whose literature is, from Plato's perspective, only literature. Or, more exactly, is only bad literature, because his non-philosophical practice of Simulacrum has, from the outset, loosened any close relation to the question of truth and to the speculative tension that this induces. But, from this perspective, whose normative aspects are obviously debatable, we must remember this: in the perspective thus outlined, the notion of truth cannot have two meanings; one "literary" and the other "scientific." The aim of the philosopher being precisely to hold a discourse of truth which has value on both planes simultaneously.

From here, we can come to a hypothesis of a philosophical nature concerning literature's own project, by revisiting its own substance. And if this project, rather than being definitively external to the order of knowledge, belonged constitutively to it? What if literature was itself a form of knowledge, if not "the" form of knowledge? The properly theoretical function of literature could be to rid us of the irrational adherence to a certain mythical representation of "the" knowledge, of "the" science, and of knowledge in general. Understood as an exclusive form, closed in, once and for all, on its own models and systems that cut it off from any literary virtue, and even defines itself by rejecting it at the cost of an epistemological break. Bachelard perfectly represented its parameters: on one side, the downward slope of poetic reverie with its lazy

archetypes, and on the other the conquests of the scientific spirit with its laborious certainties. These two orders maintain their purity by preserving the imperviousness of their respective operations.

Therefore, to speak of literary philosophy, would be to envisage a new approach to literature, to cease regarding it as definitively cut off from the general problems of knowledge, and therefore as being completely indifferent and external to the question of truth. Perhaps a philosophical reading of literary texts would be possible, would reveal the forms of a cognitive apprehension of reality, also obsessed, in its own way, by this question of truth. But this reading replaces another, one that we can call aesthetic or aestheticizing, the term understood in the precise sense of that which emerged at the end of the eighteenth-century. A time when, by extraordinary coincidence, philosophy in France became "literary" in the institutional sense. This concept of aesthetics was formulated to create the conditions for a strict demarcation between the realm of knowledge and that of taste; which critical thought designates as completely separate intellectual interests. However, to speak of a literary philosophy in the new sense envisaged here would be to precisely question the principle of this demarcation, and to remove literature from the exclusive jurisdiction of judgments on taste, and thus, in a way, to de-aestheticize the process.

The following question then arises: how to understand literary works by refraining from referring them to "aesthetic" norms, such as those of beauty or pleasure, and to take seriously, outside of any normative perspective, the calling of these works, that is, to enunciate a certain form of relation to the world and to reality that is not completely foreign to the general concerns of knowledge? It is thus a question of returning to the relation which, traditionally, passes between literature and philosophy. Rather than going from philosophy to literature, constituting it as a theoretical object and uncovering the elements of a philosophical analysis of the literary phenomenon, we would initiate the opposite movement. One that moves from literature to philosophy, by uncovering schematics of thought in literary texts and not simply behind them. One could almost speak of philosophemes [*philosophèmes*] which are not theoretical objects already constituted, but theoretical forms in the making, and at work, which philosophy must learn to be interested in as such. In this way, we would begin to recognise literature's own speculative function which has been obliterated by a whole tradition, locked in an alternative that makes of literature a model, or an object, for philosophy.

This amounts to recognising a philosophical value of literature and its

works. Understanding that, through this literary form, philosophical thought functions in a specific way, by means of figures that are not those of the concept, which, however, doesn't mean that they do not engage with real experiences of thought. Let us say that literature opens a new space of play for thought, corrupts its fixations, de-systematises its procedures, and ironically submits itself to a kind of generalizable critique. This is precisely why philosophers would do well to listen to literature talk to them about philosophy too, in a way that is not quite what they have grown accustomed to. If there is a philosophical function of literature, it would be a properly de-structuring one. By considering literature as a form of thought, philosophy can be freed from some of its systematic illusions, practice to read itself at a distance, detached, with a certain irony. And so, if there is a speculative power of literature, it would mainly have to do with the division, the rupture, the surprise tied to the feeling of incongruity and strangeness culminating in incandescence: access to the unthought, that is to say, the very opposite of a reduction to the known. In a nutshell, literature is of interest to philosophy in that it disrupts legitimised programmes.

And, it is in this way that it destabilises the order that an aesthetic theory claims to have imposed upon it. On the horizon of aesthetics, we find religion is frequently masked or bare faced, with its evocation of absolute values, which, in themselves would be beyond all suspicion. But the literary experience of thought is not one of sanction or legitimation: it is rather a controlled vertigo, because it has its rules harbouring first of all the value of challenge and provocation. In saying that literature is not indifferent to truth, but maintains a certain relation with it, we must be careful not to substitute the criterion of the beautiful for that of truth, with a view to integrate it into a new system of legitimation. The relation that literature has with truth is a critical relation, an aggressive relation, which takes the form of questioning and a putting into question. Literature is not a well-formed set of answers to questions that have already been posed and can thus claim to be recognised as having truth in itself: but rather it consists of asking questions, inasmuch as those ones are the real questions. That is, unanswered questions, at least without presupposed answers, questions that are worthwhile independently of the fact of providing answers of a certain type. And, to repeat, this type of activity can only interest philosophy.

Having recognised this, it becomes possible to restore a certain relation of proximity between literature and philosophy, if only on the matter of the problems posed by a reading of their respective texts.

We read a philosophical text with a view to understanding it. But what is understanding a text? And are philosophical texts the only ones to necessitate such an operation? If to understand a text consists in bringing it back to its ideal content, it is clear that this kind of approach is not valid for the literary work which, in most cases, exposes itself to be denatured, to lose, as one says, its authenticity, when it is brought back to the bare level of a literature that conveys ideas, in the sense that we speak of a "literature of ideas." But it isn't clearer that this type of approach is any less worthwhile for the work of philosophy, whose true purpose is not to "convey ideas," in the sense of opinions concerning a number of major problems of general interest, problems for which every great philosopher would bring his own solutions, in such a way that we would only have to take note of them by reading his works. Thus, to read Spinoza's *Ethics* is not to inform oneself on what a certain Dutch philosopher might have to say to men of his time concerning questions on the existence of God, or of the reality of the outside world, or at least it is not only about that. Rather it is to assimilate the articulated system of arguments and concepts which, for us today still allows us to re-engage these themes in a perspective of a problematisation rather than that of a resolution. It authorises us, beginning from a careful reading of texts, to ask the same questions again, under a new light that modifies the point of application. For it is clear that questions, like that of the existence of God, or that of the reality of the external world, no longer hold the same importance for us as they might have done for men in the seventeenth-century.

What is proper to the philosophical approach, what would distinguish it from literature, is to conceptualise and argue. And this, by inventing modes of conceptualisation and argumentation that do not fit into a framework defined once and for all by a general logic, imposing on these modes a uniform structure. If philosophy reasons, it almost always dilemmatically [*dilemmatique*], which leads it to project its discursive productions in a space of dispersion, where philosophies play, in all senses of the word, with their concepts and their arguments. In the end, philosophy, as a global method of reasoning, that offers definitive solutions to a number of major problems, does not exist. Or rather, it exists only through the texts of philosophers, who in context, render operative the various articulated systems of arguments and concepts, from which, concerning these problems, their particular views emerge, posed again each time under different conditions. And that is why no rational constraint will ever force anyone to be absolutely Platonist or Aristotelian, Cartesian or Spinozist, Kantian or Hegelian, Russellian or Wittgensteinian. For if such choices are "rational," it is precisely to the

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extent that they are undertaken without the need for constraint, but in a freely reasoned way. But yet, by reasoning freely, we learn to reject truth in the plural, that is to say, to understand that a problem can, according to the way it is approached, receive different types of solutions which, situated in their proper context, are all equally if not indifferently, acceptable, that is, not to blindly admit but at least liable to be discussed philosophically.

This is the reasoning to which philosophy refers and which constitutes its *raison d'être*, occurring only exceptionally as an inset, which takes place only if philosophers are called to confront one another in the field. One would almost be tempted to speak of an arena, a speech, and a debate, where they seem inseparable from the real presence of the protagonists who, to defend them, personally commit their responsibility. In that case, philosophy operates in the mode of dispute, where everyone defends their point of view on a question. This exposes it to a permanent downward spiral, because such a dispute takes place under the gaze of an audience, that each protagonist is willing to take as witness on the validity of his approach, which considerably complicates, even diverts, the stakes of the debate. While, in his text and at a distance, he attempts to outline the presuppositions of his approach, which makes it possible to question it. The philosopher-author is before anything in discussion with himself, by the intermediary of his text, where his manner of thinking is projected as in a mirror, and he calls on it to settle the debate with the philosopher-reader as judge, he does this by implicating himself in the unfolding of his own argument. There is no doubt that literary and philosophical texts are not constituted in the same fashion, and do not call for similar types of reading. But the problems that their understanding bring to the fore are not radically separated: they communicate with each other, they intersect and overlap. One fails to see how they could continue to be indifferent to one another. Experimenting with a philosophical reading of literary texts, so too with a literary reading of philosophical texts, does not inevitably bring literature and philosophy onto the same plane, which could only be done at the risk of minimising their respective dispositions. But it is to open, for one, as for the other, new perspectives of apprehension, and, measuring them one to the other, rubbing them against each other, perhaps to make appear glimmers of truth.

Translated by Serene Richards

Bibliography:

Barthes, Roland 1979, 'Lecture in Inauguration of the Chair of Literary Semiology, Collège de France, January 7, 1977,' *October*, 8:3-16

Mark and Lack: Formalism as Fidelity

Reza Naderi

Abstract: Badiou's essay *Mark and Lack: On Zero* was published in the last volume of *Cahiers pour l'Analyse* (*Cahiers*) in 1967 shortly before the May 1968 events in France. In *Mark and Lack* Badiou provides a sustained critique of two essays published in the earlier volumes of the same journal by Jacques Alain Miller called *Actions of Structure* and *Suture* (see the bibliography). The latter two essays provide an effort to bring together the categories of structure and the subject in a theory that borrows from psychoanalysis (Lacan) and mathematical logic (Frege), dubbed by Miller the 'logic of signifier'. In *Mark and Lack* Badiou criticized this theory in its metaphysical assumptions as well as epistemological approach. In this essay, we read Badiou's *Mark and Lack* closely and reconstruct its major arguments. But more importantly this essay attempts to show that *Mark and Lack* should be read as the first chapter of a larger project which culminated in Badiou's magnum opus *Being and Event* by establishing the foundational concepts of discipline and interiority, and by showing that *Cahiers* and psychoanalysis commitment to science is not thorough enough. The introduction of indeterminism and non-identity to the science perceived as the realm of self-identity by psychoanalysis is abrupt and ideological. It is exactly by deepening the commitment to scientific formalism and determination that Badiou finally opened the path to indeterminism and non-self-identity, of the entire situation of being. Non-identity is the law of being not of the subject.

Keywords: Epistemology, Logic, Computability, Epistemological Rupture, Subject and Structure, Suture, Discourse, Discipline, Interiority

Jacques-Alain Miller delivered the lecture named *Suture* as an intervention at Lacan's seminar *Critical Problems for Psychoanalysis* on Feb 24th 1965, a few days after his 21st birthday. Suture is a word picked from the ordinary language and is used by Miller to apply to a very specific field in the Lacanian psychoanalysis – the logic of the signifier. Central to the efforts of Miller was Gottlob Frege's conception and generation of natural numbers. Frege believed that numbers are logical constructs and are generated based on pure thought: what has been referred to as Frege's logicism. The construction of number in Frege's system was a purely logical task, but according to Miller the general field of logic used by Frege in order to generate the concept of cardinal number and the concept and generation of natural numbers, is itself rooted in a more 'primordial' logic, the logic of signifier, which in Miller's analysis thematizes the Frege's generation of cardinals. Central to this logic is the notion of the subject as a role or position within the structure that while it holds the structure

together, it captures the relation of the system to something that does not exist but yet 'determines' the system. Subject is thus a conceptual apparatus that performs two crucial roles in any structure:

1. It inscribes what does not exist as something that is registered within the structure.
2. It allows for what does not exist to cause the structure to exist and to expand.

In short, the claim made by Miller is that structured ensembles (and the sequence of cardinals is an example of such ensembles) are all built around a subjective core – it is this subjective core that is the 'essence' of o such structures, or no structure exists without a repressed subjective core. In this sense subject is a meta-logical or even ontological apparatus, and by no means refers to anything experiential or substantial or objective, which usually denotes human individuals. There are only two discourses that do not repress this subjective core: psychoanalysis and Marxism. Miller calls these the discourses of overdetermination. The larger programme, of which *Suture* is a piece, is to provide a general theory that unifies these or any other discourses of overdetermination. Miller calls this general theory the unified theory of discourse.[1]

Badiou's *Mark and Lack* is a sustained critique of Miller's larger programme in general and of *Suture* as its demonstrative piece in particular. Right out of the gate, in the very first paragraph of this seminal essay Badiou lays his cards on the table, so to speak. It is in the spirit of the epistemological rupture that he speaks, the rupture that breaks epistemology away from ideology (and common sense alike, one might add) as it evacuates from science any notion of Truth, and replaces it with "a mechanism of production"[2]

What does this rupture say about logic? The question here is what logic does Badiou have in mind?

Badiou says that there is an ideological representation of logic too in which there exists a presupposition of the positing of Truth rather than the construction of an object. In this representation, which Frege is in part responsible for by abruptly likening "a proposition to a proper name whose reference, or denotation, is the True or the False", "logic incessantly coordinates as many linked inscriptions as necessary in order for it to pass from one invariable name-of-the-True to another".[3]

1 Miller 2012-A, p.71

2 Badiou 2012-A, p.159

3 Badiou 2012-A, p.159

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Classical logic focuses on the forms and categories of statements in order to sort through valid and invalid conclusions. It involves the study of the truth-involving relations between sentences; it is interested in giving a general answer to the question: when does the truth of one set of sentences guarantee the truth of some other sentence, or what does it take for one sentence to follow from some others? Doing this involves giving some kind of analysis of sentences into their parts, since whether one sentence follows from another is typically a matter of relations between parts of those sentences. The prime example of such analyses is the Aristotelian subject/predicate logic, which breaks down the sentences into subject part and predicate part, and determines that the most general distinctions between classes of sentences are distinctions between modes of predication, and the fact that we can explain valid inference by suitably categorizing the subject, and the predicate, of the sentences involved in the relevant argument.

In contrast modern logic, i.e. the logic in the context Badiou is talking about, which is the logic usually assigned to Frege, is worried about the truth-values of statements. In another word Frege is worried about the instances of a statement, and if two statements have the same instances then they are equal statements. Therefore, all statements for Frege are (complex) denoting terms: they are terms that denote truth-values. This is an important difference between classical and modern logic. In classical logic, the quantifiers did not play a significant role. With Frege on the other hand we have the transcription of the old statements of categorical logic in a language employing variables, quantifiers and truth-functions. The modern logic, mostly with Frege, invented modern quantification theory, presented the first complete axiomatization of propositional and first-order 'predicate' logic (the latter of which Frege invented outright).

This is an important clarification for Badiou. The revolution inaugurated by Frege in logic had the intent to reduce mathematics to logic and logic to a conceptual construction of truth functions. This not only makes logic a system of conceptual construction foreign to the real, it also makes mathematical objects and the mathematical theory an exercise in tautology, also completely foreign to the real – concept comes first and number thereafter. We know from later Badiou that this direction is in a direct opposition to what he has in mind about the role mathematics plays, as ontology – it is not only not tautologous, it is the science of being qua presentation. What is important here is that even at this stage of his intellectual career Badiou notices that the direction of equating logic, and with it the entire mathematics, to a complete conceptual construction is a sort of metaphysics in disguise, one that is at the service of producing

ideology of science and not the science itself.

It is the latter interpretation of logic formalized by Frege that is at the center of theorization in Miller (and Lacan). This interpretation starts from the conceptual formalization of zero based on the Leibniz principle of identity, and propagated through the number system, such that each number is the recounting of the same non-identity principle. Miller has obviously used this conceptualization of zero and number in Frege's system as the basis of his concept of suture, central to the logic of the signifier. The non-identity is of course the subject, whose subjective implication of its non-reflective part in the structure is masked by its reflective part, and yet bound through a causal connection, the non-reflective and reflective parts remain inseparable. The reflective part reduplicates the reality in the imaginary and the non-reflective registers itself as an absence, a lack, but the two parts feed off each other in a repetitive entanglement through which the more lack presses on the more imaginary will prevail, which in turn intensifies the force of the lack. But in this relationship, the imaginary is the reduplication, that is, recounting of the lack every time.[4] This is how, as remarked by Badiou, for Miller True is another name for the lack.

> The nominal movement, the repetitive compulsion that, in the chain of propositions, unravels our disbelief in the True's common patronym, marks nothing but the lack over which this movement glides without resistance or success.[5]

To this logic, containing the two folded process of reduction to lack (True) and the reduction of the latter to non-identity, Badiou wants to posit a different logic: the logic of stratification, in order to show the true closure and foreclosure of science (and more particularly mathematics) such that within it, it does not lack anything that it doesn't produce elsewhere, and such that he could finally show that: "The logic of the Signifier is a metaphysics: a representation of representation, an intra-ideological process and progression."[6]

What is at stake in our view however is not just whether two views of science, one more or less attributed to Althusser and one being worked out by Miller and other *Cahiers'* editors, can converge or they indeed diverge. We think the question for Badiou is really whether the logic of

4 See Miller 2012-A for the general logic of the signifier and the role of the subject and Miller 2012-B for Miller's appropriation of Frege's construction to found the logic of signifier.

5 Badiou 2012-A, p.159

6 Badiou 2012-A, p.159

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the signifier can commit to the epistemological rupture or not. Badiou, as we will witness, is committed to the original Bachelardian project, in which the objective process of science lacks nothing it cannot produce within itself. The issue however is that in Badiou's mind, Miller *et al* have attempted to bypass this notion of scientificity by succumbing to Frege, whose method allows them to identify a repressed element in science: the non-self-identical element that is repressed and then sutured to the entire process. This allows Miller *et al* to import a primitive into the foundational theory: the subject. It seems to me then that the real problem for Badiou in accepting the theory of the signifier hovers exactly around the same point: the point of subject within the structure. For Lacan and Miller the entire process of language is marred by an imaginary process. This process is necessary for the dynamicity that is embedded in the speech. For this dynamicity to hold ground it is necessary to assume in the clinical setting the role of a reflective element: in that sense for the clinical setting it is a mandatory assumption. Miller's ambition however is to use the same reflective element in a much wider stage, that is for the entire science. He is generalizing something that is operative to a specific field of human sciences, beyond its applicability.

> The thesis we are defending here aims only at delineating the impossibility of a logic of the Signifier that would envelop the scientific order and in which the erasure of the epistemological break would be articulated.[7]

Therefore, Badiou's project in *Mark and Lack* contains three components. First, he wants to show in mathematics, as in the rest of science, which the epistemological rupture demarcates, there is no lack, and nothing within it, including its progression, is motivated or dependent on the functioning of a lack. Second, any deliberation on the foundation of mathematics and science should first consider requirements from within those fields, and not for example from psychoanalysis or historical materialism; it is up to mathematics to define what is required for the foundation of mathematics, and if the lack does not appear anywhere in the theory we should take that hint very seriously as the sign that its foundation does not need a theory pertaining to that notion. And third, as a conclusion, he wants to show that there is an inversion underlying the way in which the theory of the signifier is formulated. The theory of the signifier, which pertains to psychoanalysis is turning the requirement specific to a particular discourse and extends it to the rest of the discipline of science, which to

7 Badiou 2012-A, p.160

Badiou is a clear sign of an ideological recapture, "in which every science comes to mime its own reflection".[8]

In what follows we will follow Badiou's argument closely to show each of these points that may be scattered through his remarkably concise and dense essay.

The first thing to note is Badiou's definition of the theory of logic:

The theory of logic pertains to the modes of production of a division in linear writing or inscription.[9]

According to this short concise and preliminary definition logic comprises two main components:

3. Linear writing – a mechanism that produces strings of signs or syntagms
4. Modes of production of a division – a mechanism that takes the above syntagms and divide them into a dichotomy, or two sets

At the two ends of the spectrum we have finitely many individual marks, which like atoms are indivisible and independent, and which we call them alphabets, and we have two disjoint classes of strings of marks, one we call derivable and the other one non-derivable.

The further breakdown of concatenation, formation and derivation is really another way of categorizing the two concise operations above: putting marks together (concatenation) and dividing the ensuing syntagms to syntactically correct/incorrect groups (formation) and further dividing the former group (correct) to derivable and non-derivable classes.

The way Badiou uses the latter categorization and his repeated reference to mechanism or machinery of logic is reminiscent of the Leibniz logic machine or its modern reincarnation, the Turing machine.[10] The above processes then resembles a set of algorithms that execute based on the raw material, and which produces outputs that are consumed by the next operation in line.

Therefore, we define concatenation as the operation that draws from a set of alphabets and produces finite sequences of marks in a linear order, which may include repeating marks. The machine can produce these sequences of letters in whatever order and each sequence will be

8 Badiou 2012-A, p.159

9 Badiou 2012-A, p.159

10 Tom Eyers remarks: "Logic is rendered by Badiou here as a self-constituting, self-perpetuating "machine,' impervious to the vicissitudes of the subject or the signifier." (Eyers 2013, p.84). This remark does not match Badiou's project and is more aligned with the constructivst project. Logical machine is not a determinate process. The whole point of the Turing machine is the demonstration of the fact that the determinate algorithmic process may have indeterminate results.

fed into a subsequent algorithm. Badiou calls the output of the machine from the first phase of the operation (concatenation) set *S*.[11]

The second operation, formation, takes the output of the first operation, or starts reading from *S*, and will decide whether the sequence of marks is valid syntactically or not – the rejected clauses are usually labelled as 'non-sense'. Furthermore, this split to valid and invalid subsets is a dichotomy, that is, there is no remainder. The fact that there is no remainder, the algorithm produces only a dichotomy, is a by-product of Gödel's proof, that is, as Badiou points out, the very possibility of Gödel's undecidability presupposes the existence of a dichotomic mechanism with its raw material. This is an important assertion for Badiou. First, it is only based on a perfect dichotomy that we could proceed to the operation of derivation, which is the next operation in line. But secondly it is based on an entirely decidable closed mechanism with no compulsion to repeat that we can even recognize the existence of what is known to be un-closable, and thus internally limited. So, the second point Badiou wants to make with this remark is this: "*The exhibition of a suture presupposes the existence of a foreclosure*."[12] Foreclosure comes before suture and it is logically prior to it. Therefore, for establishing any claim regarding the existence of a structure whose integrity is preserved by the operation of suture we must have a system that is closed but at the same time is not caught up in an endless loop.

The word algorithm in computer science is usually referred to a set of instructions that for a given input are deterministic and they halt. Loop is a part of algorithm that may cause certain algorithms to not halt for certain inputs. The essence of the computability theory comprises two tasks:

1. Whether for a certain problem there exists an algorithm that can provide the answers.
2. Whether the algorithm is complete, that is for some certain given conditions (e.g. inputs) the algorithm is deterministic and it halts.

In computability theory, there are countless such algorithms. The very existence of these algorithms should be a counter example for the generality of the logic of signifier and the structural dynamics that it intends.

11 Although it is not clear whether this matters to Badiou and the algorithm he presents whether *S* is finite or infinite, but it does to the algorithmic behavior of the machine. In other words, it is important to know whether the next operation starts when the first operation halts or not. With the current specification, there is no requirement for such dependency in the function of the two operations: the second operation can start as soon as the first operation reaches an output. This in software design is called trickle-feed.

12 Badiou 2012-A, p.162

The algorithmic nature of the formation operation is guaranteed to result in, as said before, a dichotomy, one of which is the set of well-formed expressions, which Badiou names *E*.

The third operation, derivation, uses the well-formed expressions from set *E* and determines whether the expression is derivable (it is a thesis in the system) or it is non-derivable (it is a non-thesis in the system). If *e* is an expression in *E* and *e* is a thesis then *e* belongs to the set of theses *T* and if *e* is a non-thesis it belongs to the set of non-theses *NT*.

Furthermore, there is an operator ~ (negation) such that:

$e \in T \Leftrightarrow {\sim}e \in NT$, and vice versa,
$e \in NT \Leftrightarrow {\sim}e \in T$.

So, if we have two expressions e_1 and e_2 both belonging to *E*, and $e_1 \in T$ and $e_2 \in NT$ we can also write ${\sim}e_2 \in T$ and ${\sim}e_1 \in NT$.

If the above were true then the derivation operation like the operation before it would have created a perfect dichotomy: *T* and *NT*, and the perfect dichotomy would have been based on a certain relation that existed between each expression and its negation, such that if one belonged to one set the other belonged to the other set. That is, it would not be possible to have an expression and its negation belonging to the same set. If, as Badiou presents, we use the symbol '...' to denote the relation between an expression and its negation, i.e. '*e* ... ~*e*' means the relation between *e* and ~*e*, then, following Badiou's lead, we can say that the mechanism of derivation, in case of a perfect dichotomy, cuts right through the middle of all such relationships according to which each expression and its negation belong to opposite sides of the perfect dichotomy:

Mechanism of derivation
e **.....|..... ~*e***

If a perfect symmetry such as this existed David Hilbert's dream of having an effective procedure (an algorithm) capable of proving all truths about axiomatic systems were possible.

Hilbert at the great mathematical congress held in Paris in 1900 posed ten problems to the world of mathematics. In 1928, he rearticulated them in three major categories of problems, which Stephen Hawking summarizes them as follows:[13]

13 Hawking 2007, p.

1. To prove that all true mathematical statements could be proven, that is, the completeness of mathematics.
2. To prove that only true mathematical statements could be proven, that is, the consistency of mathematics.
3. To prove the decidability of mathematics, that is, the existence of a decision procedure to decide the truth or falsity of any given mathematical decision.

Gödel's incompleteness proof in 1931 dashed Hilbert's hope, or at least part of his hope. Gödel's incompleteness theorem disproves the first of these challenges.[14] He proved that in a consistent system it is possible to have expressions such that neither it nor its negation is provable, that is $e \in NT$ and ${\sim}e \in NT$ at the same time. Such an expression in Gödel's term is undecidable. The undecidability of a well-formed expression however does not disturb the fact that the derivation mechanism cuts *E* into a dichotomy, because it still does. The issue is not that we do not have a dichotomy, because we still do even after Gödel. The issue is that the relation between the two parts of this dichotomy, *T* and *NT*, is no longer a perfect symmetrical relationship such that when an expression belongs to one set its negation *always* belongs to the other set, because sometimes an expression and its negation are both un-provable. Therefore, the meaning of incompleteness is this: one of the undecidable expressions (*e* or ~*e*) must be a thesis, but in a consistent system we cannot prove either of them, so therefore *T* is not a complete set of all theses (because we cannot derive some of them).

The fact that Gödel proved the existence of undecidable expressions does not speak to the undecidability of the systems, which corresponds to Hilbert's third problem. The third problem, the decidability of a system, exists even after Gödel. However, after Gödel, it is no longer possible to prove the truth of all expressions, we have to suffice with determining whether they are derivable or non-derivable (while may still be true).

Perhaps, in passing, it will be useful to provide some remarks regarding the third problem whose aim is not the ability to derive (i.e. to prove or disprove) an individual statement, but to come up with a *procedure* able to determine any statement in the system (whether it is derivable or not). After Alan Turning we now call this the 'computability problem', i.e. a

14 The second incompleteness theorem, an extension of the first, shows that the system cannot demonstrate its own consistency. (Wikipedia) The second theorem disproves the second problem.

problem that can be solved using a Turning machine, and in computer science, we express this problem as the ability to articulate the solution through an algorithm that a computer can execute. If all axiomatic systems were decidable, what Hilbert had hoped for, then we could say that for every system there could be finitely many algorithms that can decide the status of every correctly formed statement in that system, and determine whether they are true, false or undecidable.

First Alonzo Church and then, almost simultaneously and independently, Alan Turing disproved Hilbert's decidability problem (using lambda calculus in the case of Church and in the case of Turing using a completely novel method, which we call the Turing machine today).

The intriguing way in which Turning solved this problem gave rise to another problem, which is almost as important as the three problems by Hilbert.

> 4. Given the existence of an algorithm to solve a problem, is the solution practical?

The informal term 'practical', used above, means the existence of an algorithm solving the task that runs in polynomial time on a Turing machine such that the time to complete the task varies as a polynomial function on the size of the input to the algorithm (as opposed to, say, exponential time). Computer scientists call this the complexity problem, based on which they divide questions into two classes: the general class of questions for which some algorithm can provide an answer in polynomial time. They call this 'class *P*' or just *P*. In contrast, for some questions, there is no known practical way to find an answer, but if one is provided with information showing what the answer is, it is practical to verify the answer. The class of questions for which an answer cannot be found but can be verified in polynomial time is called *NP*, which stands for 'non-deterministic polynomial time'. It is important to note that both *P* and *NP* classes of problems are solvable problems, i.e. there exist algorithms that can find the answer to their questions, but in the case of *NP* this answer cannot be given in any practical way.

Despite this categorization it was not possible, before 1971, to prove that a problem is *NP*. In order to prove that a problem is *NP* we must prove that there is no algorithm that can find answers in polynomial time. In 1971 Stephen Cook found the first *NP* problem. He proved that the Boolean satisfiability problem is a *NP* problem. This result is now known as the Cook-Levin theorem. Using this theorem, it was now possible to show certain problems are at least as hard as the Boolean satisfiablility problem, and therefore they must also be *NP*. This lead to a new subset of *NP*

problems we now call *NP*-complete problems. *NP*-complete problems are a set of problems to each of which any other *NP* problem can be reduced in polynomial time, and whose solution may still be verified in polynomial time. That is, any *NP* problem can be transformed into any of the *NP*-complete problems. Informally, an *NP*-complete problem is an *NP* problem that is at least as 'tough' as any other problem in *NP*.

A number of important and useful problems are proven to be *NP*-complete. For example, the prime factorization problem is a *NP*-complete problem, something that mathematician John Nash hinted at in 1955. Prime factorization is the basis for encryption because when the key is known, its verification is *P* but when the key is unknown the answer to the algorithm runs in exponential (non-polynomial) time, relative to the length of the key.

The reason this little excursion may be useful is that it accentuates a stark contrast of ultimate importance to Badiou as well as to this project. The early to the mid twentieth century discoveries regarding what is provable, what is computable and what is complex, Gödel, Church and Cook results respectively, are limitations, or better said consequences of axiomatic thinking.[15] They are not signs of a repressed lack in science – it was not the case that scientists are re-experiencing an impossibility that as a traumatic core in science keeps repeating itself – but more so the signs of the affirmative power of science: the fact that science continues to think beyond its determination set out by a particular discourse about the science – which in this case is Hilbert's program – what the generation of French philosophers at the time, and in particular the Althusser's milieu, was referring to as the epistemological rupture. One of the central theses of the present project is that the culmination of this 'rupture' is what informs and underlies Badiou's mature work: the excess of being over language, captured by the axiom of actual infinities. This of course was not yet present at the time Badiou was writing his audacious rejoinder to Miller, but from the way Badiou is troubled by Frege's and Miller's appropriation of logical laws in order to ideologically re-appropriate certain metaphysical imports, it is clear how Badiou is on the path to discover what will eventually informs his entire project.

> What are these metaphysical imports?

The law of self-identity belongs to symbols, which Badiou calls marks, not objects. Identity of marks is an intra symbolic law and has no import

15 One should of course add Russell's paradox to this list,

to the realm of physical objects.[16] When we say a symbol x is identical to x wherever we write x, we are simply stating a self-evident fact, a fact that its negation is unthinkable. That is, the lack of self-identity of symbols will not find its own symbol within the set of symbols: there is a lack of mark for such an absurdity. The set of marks is foreclosed to such a lack.

Badiou makes the latter point clear through devising a function to represent the equal sign: instead of writing $x = y$, using this function we write $I(x,y)$. In that case we have always the following two formulae:

$I(x,x)$, every variable is equal to itself
$I(x,y) \Leftrightarrow [A(x) \Leftrightarrow A(y)]$

The latter formula, written in first order logic, means that for any given function A if the value of A is the same for x and y, it is because x and y are equal and vice versa.

What about $\sim I(x,x)$, a completely permissible or well-formed expression in the system? Can it not be the mark of non-self-identity that we are seeking? Absolutely not! The expression $\sim I(x,x)$, the formula for self-inequality, is permissible solely on the basis that the first x in the function is the same as the second x in the function: the same mark written in two different places are not two different things, which is the meaning of the self-identity of the marks.

The production of the logical concepts of equality and self-inequality presupposes the foreclosure of what is scripturally non-self-identical. The lack of the equal is built upon the absolute absence of the non-identical.[17]

Here one can see the power of stratification that logic is capable of applying to itself. The production of $I(x,x)$ and $\sim I(x,x)$ are the outcome of the function of concatenation we saw above. The function of formation puts both of these expressions in E, since they are both well formed. The function of derivation is the one that puts them into two different categories of expressions T and NT. If the set of true expressions in a logic is the outcome of the last operation (derivation), then in that set there is no presence of $\sim I(x,x)$. The identity of marks or graphemes is the law of the first operation (concatenation), whereas the expression of self-equality as the truth is the outcome of the third operation (derivation).[18]

16 This is an important distinction from the point of view of Badiou's later development. The operation of count-as-one is an operation that belongs to situations not being qua being as inconsistent multiplicity.

17 Badiou 2012-A, p.167

18 There is a powerful consequence of this method of stratification, which will become important in Badiou's later development. In set theory, there is a clear distinction between construction

By mistakenly assigning the law of self-identity to objects, a metaphysical assumption on its own, a space is opened for a mark within the realm of symbols for the relation of non-self-identity that exists in the realm of the physical objects. The mistake is the exportation of this law to a domain that this law has no import, no applicability. This metaphysical move opened up the symbolic/logical order to the registration of an impossible relation among objects, which by itself may not be a wrong move: it is possible in a language to name an impossibility, un-think-ability of a relation between objects in a separate domain of which this language speaks, but the language cannot name something that is unthinkable within itself.

The second metaphysical move ironically committed by Frege, a pioneer in axiomatization of logic and mathematics, was to think that logic actually provides a stratification of the objective reality, or it is a language that speaks of a domain other than itself, indeed of the physical reality, and accordingly he thought it quite legitimate to name the impossible relationship of non-self-identity by a mark inside logic, that merely indicates this impossibility that exists in the other domain.

So, what about zero then? If there is nothing that sutures logic to the empirical domain then how can logic produce the notion of zero?

Let's consider the formulae we defined above for the equal sign:

$I(x,x)$,
$I(x,y) \Leftrightarrow [A(x) \Leftrightarrow A(y)]$

And let say that in a theory based on first-order-logic-with-equality the above formulae that define equality of two variables are part of the axioms of that logic.[19] Now let's consider the first part of this formulae: $I(x,x)$ and

of sets extenstionally (by picking elements from other existing sets) or intensionally (by declaring a formula that defines a set). Russell's paradox shows the latter definition of sets is inconsistent – which eventually resulted in having an axiom in set theory called the axiom of Separation. One of the consequences of the Russell's paradox is that there are many well-formed formulae for which a set cannot exist. At the surface, this may look like that within logic we have the ability to produce things that do not exist, implying that logic may exhaust a greater domain than ontology. But the method of stratification clears this ambiguity. What matters to logic is the result of the last operation: operation of derivation. The seemingly larger domain is the outcome of the first and the second operations. Therefore, for example, an expression such as the self-belonging set, which is the basis for the Russell's paradox, is filtered out (actually as a non-well-formed expression during the formation operation).

19 We are following Badiou's definition of equal sign. A first order logic with equality is usually taking the equal sign as a primitive in the system and has a number of axioms associated with it, of which reflexivity is one of them (it has more axioms than the ones enumerated above). It is worth mentioning that in certain interpretations of first order logic equality may not be a primitive logical symbol. This logic is referred to as first-order logic without equality. If an equality relation is included in the signature, the axioms of equality must now be added to the theories under consideration,

its negation ~ $I(x,x)$, which as we saw are produced by the function of concatenation in S and are slated as well-formed by the function of formation in E. But the function of derivation dispenses them separately into T and NT respectively.[20]

Now let say that we come up with a new mechanism M_4 that adds to M_3 a predictive constant 0 we are going to define as follows.

Let say in our system the function $R(x,y)$ expresses that variables x and y are related within the system. Let us also assume that R is reflexive, that is $R(x,x)$ states that whether variable x has a certain relationship R with itself: 'to be linked to itself by the relation R'. Let us name the latter function (whether a variable is linked to itself through relation R) as A$r.R$, and accordingly A$r.R(x)$ means that x has the relation R to itself.[21]

Now, let say that instead of the first order logic we operate in second order logic, in which we can now select over not just variables but also functions. In that sense we can define the above definition in the following way:

$$\forall R,x\text{: A}r.R \Leftrightarrow R(x,x)$$

Given the definition above it is easy to see that how I is such an R according to the axioms. That is, the axiom of equality (identity) will allow M_3 to derive A$r.I$ and will not derive A$r.{\sim}I$. Let's define 0 predicate as the following:

$$0 = \text{A}r.{\sim}I$$

Or in other words:

$$\forall x\text{: } 0(x) \Leftrightarrow {\sim}I(x,x)$$

Now, the predicate 0 is an inscription that is accepted by M_2, due its well-formed-ness, and therefore it is in E, rejected by M_3 because it cannot be derived, and added back again to T by M_4. What M_4 did was to add a mark to T for a non-derivable relation.

instead of being considered rules of logic. For example, there is no primitive = in set theory, that is equality of two sets must be defined based on the axioms of the set theory and ∈ operator, which is its only primitive operator.

20 Badiou terms the functions or mechanisms of concatenation, formation, and derivation M_1, M_2, and M_3 respectively. We shall also follow that convention.

21 We can also say that A$r.R$ means R is reflexive.

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> The zero marks in M_4 (in predicative form) not the *lack of a term* satisfying a relation but rather *a relation lacing* in M_3, the relation ~$I(x,x)$. We must nevertheless add: if the relation can be lacking in M_3, it is *only insofar as it figures in* M_2.[22]

How is 0 *predicate* derived here by Badiou different from 0 *term* derived by Frege (and used by Miller)? The difference is that the latter marks the lack of a *term* and the former marks the lack of a *predicate*. Frege's version of zero states that there is no term x that can satisfy the negation of Leibniz identity principle, which as we saw is something that is fraught with metaphysics. 0 as predicate however mentions that a predicate that exists in one stratum (M_2) is erased from another stratum (M_3), for which we are going to devise a mechanism (M_4) to add a mark as a trace of this erasure. This is not just a zero sum game. Lack of a term and lack of a predicate are totally different things for one important reason: term (especially in Frege's use) is a non-logical artefact whereas the predicate A$r.{\sim}I$ is an artefact of logic produced by M_1 and ratified by M_2 – we're still well within logic: 0 is not a mark of what logic lacks, it is but what logic produces to trace the lacking of a mark within its extendible stratification.

> [Science is] stratified in such a way that no lack is marked in it that does not refer to another mark in a subjacent order differentiated from the first.[23]

Here we should emphasize two points, very important to the overall argument that Badiou is producing. In number of places in this short essay Badiou emphasizes that we should differentiate logic from the discourse about logic. The discourse about logic, which is usually used for pedagogical reasons, provides intuitive or commonsensical conceptions that are foreign to logic itself.

> Like Lacan's accounts of Gödel's theorem and the semantics of implication, Jacques-Alain Miller's discussions of Frege and Boole are ambiguous in that they combine, simultaneously and indistinctly, what pertains to the effective construction of a logical mechanism with what pertains to the (ideological) discourse through which logicians represent their constructions to themselves.[24]

22 Badiou 2012-A, p.170

23 Badiou 2012-A, p.171

24 Badiou 2012-A, p.165

This criticism, which goes to the heart of Bachelardian theory of epistemology as a non-empirical endeavour, tells us that we should bracket out common sense and empirical concepts from the scientific domain, logic included, and differentiate the discourse about a discipline from the discipline itself. There is a convenient way that logicians speak about their theories, but when it comes to logic as a *discipline*, they abandon the niceties of the discourse and stick to what the *discipline* itself works with. Practitioners and people whose professions do not involve the direct treatment with a particular discipline (logic or science) are the usual victims of the discourse, and err discourse for discipline. Philosophers are the prime example of such victims, and ideological recapture/representation is what this error produces.

Gödel's theorem is a very famous case for such confusion between discourse and discipline. As we formerly saw there is nothing in the incompleteness theorem that speaks about lack in the predicate logic, or first order logic or arithmetic. It instead shows that language in a predictable way falls short of calling out, or deriving, all true statements. The logical result of this incompleteness theorem is in fact Cohen's generic procedure, which embraces Gödel's incompleteness results to show how we can constantly extend a consistent/semi-veridical ground model (an initial denumerable set) by forcing an indiscernible (or generic set). In contrast to Cohen's use of Gödel's theorem for example, which we may categorize as a legitimate, that is disciplinary, use or extension of this theorem by a logician who remains within the discipline, Lacan usage of Gödel in Badiou's eyes, is illegitimate and influenced by misconception of what the incompleteness theorem really means. Lacan's misconception states that this theorem proves the lack in the Other, which is the language or the overall battery of signifiers, and thus there is a need for an (reflective) element that has to constantly suture the Other, thence the role of the duped (and foreclosed) subject(s). The proper recapture of Gödel is by Cohen, whose main underlying and enabling thought was backed up by the axiom of Infinity. The recapture of this in ontological terms is the excess of being over language. We will speak at length in subsequent chapters about the difference of this recapture versus the ideological recapture of the theory of lack and suture. For now, however, it has been made quite clear that logic lacks nothing and using Gödel's incompleteness theorem as the proof that Other is lacking (because logic or arithmetic is lacking) is an ideological representation of the theorem.

The very concept of suture, which has motivated this response by Badiou, is itself an ideological representation caused by the conflation of discourse and discipline:

> To deploy the concept of suture in the very place where it is inadequate (mathematics), and to conclude that this concept enjoys a universal legitimacy over discourses by exploiting scientists' conflation of their own activity (science) with its (ideological) representation, is to reflect science in ideology: it is to de-stratify it so as to prescribe to it its lack.[25]

Another noteworthy point in what Badiou presents pertains to the stratification of logic. We saw how with this stratification, logic from within itself can create abstractions that produce conceptual tools to address what it needs. But the question is whether there is a way to produce a logic of stratification itself? In the footnotes and in passing Badiou names two logicians who have attempted to answer this question: Wilfred Quine and Hao Wang.[26] Quine attempted an axiom of reducibility to flatten out the strata to a single stratum and conversely Wang created an 'expansive' system Σ to traverse the strata. But, according to Badiou, both attempts have failed. This failure means that a single meta-logic for the logical stratification does not exist. He captures the meaning of this failure as follows:

> For our part, we are convinced that the stratified multiplicity of the scientific signifier, which is inherent to the process of scientific production, is irreducible to any of its orders. The space of marks does not allow itself to be projected onto a plane. And this is a resistance (or limitation) only from the viewpoint of a metaphysical want. Science wants the transformation-traversal of a stratified space, not its reduction.[27]

The effort to create a single theory that rules over the stratification of science is itself emitted from a metaphysical want – the desire to totalize. The discipline of science is of the order of infinite, and deals with the order of infinite, whose totalization is an impossibility. This yet points to how even in his early career Badiou's theoretical conception is likely imbued by the thought of infinity.

We began this inquiry with reviewing the dashing intellectual thrust made by the editors of *Cahiers* announcing a new unified theory of discourse. At the heart of this new unified theory was the announcement that we should look at the action of the structure in the presence of a reflective

25 Badiou 2012-A, p.173

26 Hao Wang (1921-1995) was one of the few confidants of Kurt Gödel. He was also Stephen Cook's PhD thesis supervisor.

27 Badiou 2012-A, p.171

element. As seen earlier in this chapter the abrupt introduction of a reflective element into the language of structuralism could be only justified when this element is seen as a primitive, as nowhere in this theory there is any assumption of the presence, let alone the action or impact, of such an element. Seen as a primitive, such as it is, Miller derived a number of intriguing properties not present otherwise in traditional theory of structuralism: the function of miscognition, the imaginary and real registers, the lack and the suture, metonymical causation to name a few – in the center of all which there is a reflective element implicated by the structure and framed in such a way that its principle of existence is of non-identity. However, while *Action of Structure* talks about the theory, it is not the theory itself; *Action of Structure* can be only understood in my view by reading *Suture*, as it is only in the latter work that we find a derivation of the concept of subject in this theory. We see in *Suture* Miller's appropriation of Frege's arguments to establish the role of the subject in the number theory, but we can understand the true scope of this derivation only by looking back at *Action of Structure*. So, while *Suture* derives the subject, *Action of Structure* uses it to for building the overall scope of the program.

It is only when we look at both works by Miller that we can properly understand Badiou's scope of rebuttal: from one hand, he has the task of countering the misconception inherent to both Frege's and Miller's derivations. Based on what we have seen Badiou is establishing the fact that there is nothing within the foundation of mathematics that requires an element of non-identity. Secondly, neither mathematics nor logic (nor science in the way demarcated by Bachelard) is sutured to anything outside of it: they don't need something to bootstrap them and get them going – like the way Frege's conception of number required bootstrapping by a recourse to the empirical version of the Leibniz law of identity. Science is foreclosed to anything outside it, it has a lack of lack, and this lack is not a lack itself – there is no trace of lack. Thirdly, science is infinitely stratified, which allows production of abstractions inside its realm, without needing to recourse to any theory or discourse outside of it – stratification whose strata are subject to a law that derives formulaically their depth and breath.

The immediate conclusion of this is that there is no subject of science: "science is a pure space, without inverse or mark or a place of that which it excludes."[28]

> Foreclosure, but of nothing, science may be called the psychosis of no subject, and hence of all: universal by right, shared delirium, one has only to maintain oneself within it in order to be no-one, anonymously dispersed in the hierarchy of orders.[29]

28 Badiou 2012-A, p.171

29 Badiou 2012-A, p.172

As also Tom Eyers has remarked[30], it is ironic that Badiou should choose 'foreclosure' a psychoanalytical term to describe science as something about which "psychoanalysis *has nothing to say*".[31] But what is looming under this term goes well beyond the psychoanalytical concept of foreclosure. The founding role that this term is supposed to elicit in Badiou's work clearly illuminates the traces of the axiomatic orientation of thought, and while the term foreclosure implies closed-ness and protectiveness, logic, science and mathematics enjoy much openness and bountifulness. That is precisely the sense of positivity that the axiomatic thinking provokes. It grounds the thought based on a finite set of circumscribed decisions or ideas, not to the circumcision or foreclosure of thought and its possibilities, but to free the thought to explore possibilities in ways not otherwise possible. Axiomatic thought is what allows science to grow on its own merits alone: foreclosure in this case is not prohibitive in any sense. On the contrary, it is the founding principle of something productive and affirmative: the mechanism of production, partly in exhibit in *Mark and Lack*, upon which science can produce its signifiers, expressions, and abstractions according to its internal laws and its founding decisions.
In that sense, although Badiou does not make any note of the axiomatic thought, we think a retroactive reading of this work, under the light of his mature oeuvre, leaves no room for doubt that Badiou is embarking on a project to juxtapose the axiomatic orientation of thought against the theory of discourse whose roots are in structuralist humanities: linguistics, anthropology, psychoanalysis, and last but not least historical materialism.[32]

As the unified theory of discourse claimed to recover the repressed Truth in science and give a unifying voice to the discourses of overdetermination, in Badiou's eyes at the time, it is evidently tormented by the same traumatic core as the philosophy itself – it attempts to bestow to science what it does not need and what it does not want: the repressed Truth of science, the Subject.

> We can claim in all rigout that *science is the Subject of philosophy*, and this precisely because there is no Subject of science.[33]

30 Eyers 2013, p.87

31 Badiou 2012-A, p.172

32 This 'liberating' aspect of axiomatic thinking is mostly discussed by Albert Lautman in *Mathematics, Ideals, and The Physical Real*, Continuum International Publishing Group 2011.

33 Badiou 2012-A, p.173

Ontology of Discipline and Epistemology of Discourse

In the last section of *Mark and Lack*, partially titled as *Alternating Chain of Science-Ideology*, Badiou uses the consequences of Gödel's theorem to clarify a significant differentiation that exists between two 'positions' that ideology could occupy in relation to science. The position that has been discussed up to now pertains to discourses that are outside of science proper. Badiou captures the intent of this category of discourse as such:

> The (metaphysical) project which, following Hilbert, enjoins every formal system to seal itself around the internal statement of its own consistency.[34]

These discourses go by different names (e.g. metaphysics) but in the context of the discussion Badiou is undertaking here we choose to call them epistemological discourses. Epistemology therefore refers to those discourses that have science as their subject but they do not produce, nor do they claim to produce, scientific theories themselves. In all their forms, epistemological discourses attempt to find from outside of a given discipline the unifying principle according to which the discipline can be defined and organized. Epistemological discourses, in that sense are transcendental to disciplines they study. Badiou uses Husserl's treatment of mathematics as nomology as an example of such a discourse. Being nomological here implies that the domain of mathematical objects can be exhaustively defined – as a formal system, mathematics is closed, saturated – in addition it means that the progression of the system by establishing different levels can take place without contradiction.[35] Nomological definition implies that the technique establishing something like a meta-mathematics can be stopped at any time, once the increased facility permits statements about reality to be obtained. These are assertions none of which belongs to mathematics proper. They belong to a discourse that occupy a position outside of mathematics. They are discursive assertions about a disciplinary practice.

In contrast to this there are certain assertions about a given discipline that are part of the discipline itself. The assertions are not part of the disciplinary theoretical body but nevertheless they are considered part of the discipline. Two recent famous examples of these in mathematics are Hilbert's programme and *Principia Mathematica* both of which are programmatic projects that make assertions about structure and

34 Badiou 2012-A, p.174

35 Lawlor 2002, pp.62-63

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nature of mathematical theory in general. Badiou captures the nature of these programs as such:

> The project which, by means of the completely controlled reconstruction of a logistical system, claims to exhaust what otherwise presents itself according to the opacity that results from a history: let us call this 'intuitive' arithmetic.[36]

We can also say that programmes like Hilbert's or *Principia Mathematica* are also representations of mathematical discipline, but representations that are intra-disciplinary, representations that are immanent to a given discipline – which Badiou calls the 'intuitive' part of a given discipline.

Therefore, according to Badiou, there are two representational domains: one is outside and one is inside disciplines, and they correspond to two aforementioned positions of ideology.

Now one way that Badiou's critique of the project of unified theory of discourse can be understood is that he does agree with the overall intent of the programme to identify and reveal ideology but both the position he identifies for ideology and the method he thinks science itself is taking to confront the ideological representation are different than Miller's proposal. The unified theory of discourse targets the transcendental position of ideology and its method is to devise a unified theory of discourse that aspires to science in order to remain non-ideological. What we are proposing is that Badiou is critiquing both the target and the method of this theory. He is critiquing the target because the ideological representation of science outside of the science is not what affects the practice of science. What matters to the practice of science are ideological representations that are immanent to it: according to the above differentiation the intra-disciplinary representations. Badiou clarifies this in the following passage:

> But that a crisis in the (ideological) *representation* of science can induce a (positive) reconfiguration of science itself should not surprise us, given that the material of science is, *in the last instance*, ideology, and that an 'a priori' science by definition deals only with those aspects of ideology which represent it in the latter: a science continually breaking with its own designation in representational space.[37]

36 Badiou 2012-A, p.175

37 Badiou 2012-A, p.175

What has a positive influence on a science, its advancement for instance, is when science breaks with its own representative designations, that is, with what a science thinks about itself (as opposed to what philosophy thinks about it). In addition to this Badiou also critiques the method of the unified theory of discourse, not just because Badiou has been able to unwind the metaphysical core of its notion of subject that is the linchpin of this theory, but because at the end this theory is just another discursive tool and discourse is not how science ploughs through its ideological obstacles. So, what is it that science does that has been historically so effective in constantly removing from its path its own ideological designations? The answer is the disciplinary engagement: it is the discipline itself whose practice constantly breaks away with how the discipline is represented inside the discipline itself, whose term for Badiou is 'Formalism' in contrast to the representation of the discipline, which as we saw before Badiou calls 'Intuition'. So, the faceoff that matters to science is the faceoff between formalism, "an entirely coded scriptural artifice", and intuition, "the immanence of a historico-institutional discourse living off the abbreviations, equivocations, and univocal smoothing of an inoffensive mass of 'normal' signifiers legitimated by custom and practice" (*Ibid*), and thereby a wholly intra-disciplinary faceoff.

And yet again, Gödel's theorem plays a key role in demonstrating this faceoff between the intuition in science, which involves "certain ambiguities produced in language by the (ideological) concept of Truth", and "formalism's *fidelity* to the stratifications and connectivities at work in the history of the science, insofar as they expel from the latter every employment of the True as (unlimited) principle."[38] In contrast to this Gödel's proof also had consequences for nomologist conception of mathematics as well. It proved that the mathematical content is not nomological, that is mathematics is not tautology. Mathematics can provide material that is not the result of analytical manipulation of axioms. As Cavaillès mentions,[39] Gödel's statement albeit undecidable, still represents an increase of knowledge. That the undecidable statement is legitimate implies, for Cavaillès, that formal systems possess their own proper content, different from experiential content. In addition, that the expansion of a formal system does not take place in a predictable way; rather, based in its own sort of content, formal systems exhibit their own sort of necessity. Together, these consequences proved that formal systems such as mathematics are not closed systems (as Husserl had postulated). Nomology can thus be perceived as the epistemological

38 Badiou 2012-A, p.176

39 Lawlor 2012

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principle around which Husserl could conceptualize mathematics as such. By prescribing or uncovering an inherent limitation in the ability to completely identify the true statements in a formal system Gödel proved that mathematics is not a nomologist system. But for mathematicians, unlike Hilbert's programme, whether or not mathematics is a nomological system or not was never a formalist concern.

Badiou thereby interprets formalism as engagement, an operator of fidelity operative inside science. The general theory of discourse is to show how the discourses of overdetermination break away from ideology. Badiou's rejoinder here is to show that the proclamation of the latter still leaves us in the realm of ideology, because it is still speaking of the discourse of science as opposed to the science itself, or in the terminology that we used here, it still posits the discourse as something separate from the discipline. The discipline of science breaks with itself: when science encounters its limitations, it treats these limitations as ideology and breaks away with them. With Miller, we always speak of ideology until science allows us to spot the ideological miscognition. For Badiou on the other hand we have scientific thinking and only when we try to think that why or how a science is a science instead of to continue making science that we fall into ideology. So, the development of sciences involves the critique of the philosophical idea of science. For Badiou, given the way he criticizes philosophy and the way in which he brings in the alternating chain of science and ideology, the point he is making is that we don't need to look between science and something else in order to see the oscillation between science and ideology. Within science we have scientific thinking, while at the same time we have scientific ideology: the case in point is what is happening between Gödel and *Principia Mathematica*, the latter standing for an ideological recapture of mathematics, inside mathematics itself. What we said earlier in this chapter regarding Church/Turing and Cook/Levine theorems are also examples of such a break from Hilbert's programme, which equally stands for an ideological recapture of mathematics, and again within mathematics proper. That is why Badiou says that through science we learn that there is something un-sutured.[40] Opposite to the claim that science is the science of suture, we learn that through the scientific practice we get something that is not a hiatus between ideology and science. Scientific practice is a constant separation between formal means of thinking and formal means of representing. In this sense science continually breaks with its own designation in the representational space. Therefore, rather than staging the debate between science and ideology at the level of discourse, Badiou brings back this de-

40 Badiou 2012-A, p.174

bate to the level of discipline: the level of production and practice of true science. In *Mark and Lack* Badiou has shown us that logic is a practical endeavour: the practice of recognizing, concatenating and deriving marks, traces and expressions. With this he brings the debate over logic from the level of discourse to the level of discipline. It is within the discipline itself that a division with ideology takes place. This division then concerns the being of science, and it is not a division between science and something else.

Now why is this important? This distinction anticipates three significant themes in Badiou's later work. The move from discourse to discipline means the move to the very entailment of things, to the level of their being, and thereby designates a move from epistemology to ontology. From this point of view the second theme is motivated by the recognition of scientific process as a process of fidelity. And finally, the fact that the hiatus does not take place between two realms but between a realm and itself, one could see how it gives rise to the theory of event. In addition, in the way Badiou presents Gödel's theorem as a nexus of interconnected commitments to the logical construction as well as the confrontation with tacit or declared ideological positions suggests in an implicit form a sort of engaged theory of subjectivity, and although Badiou in *Mark and Lack* is still within the Althusserian world of epistemology, his viewpoint here seems to anticipate the next chapter in Badiou's development to fully engage with the theory of the subject. This is what we will take up in the next part and show how Badiou from here will undertake the project of the subject.

Conclusion

In an interview with Peter Hallward in 2007[41] Badiou mentions that *Cahiers* project was inspired based on a certain understanding of structuralism as "a certain Lacanian interpretation of scientism".[42]

They sought to find in scientism itself, in extreme forms of formal thought, something to support the Lacanian theory of the subject. In my view that is why Miller's text 'Suture' is programmatic. It is a fundamental text in this regard, because this is the text that manifests the synthetic genius for which Miller must undeniably be recognized: he shows that for Frege the logicist reconstruction of the theory of numbers conceals an operation which can only be interpreted as the operation of a subject. I would say that this was the general orientation.[43]

In early 60's the general problem of the relation of structure and subject were raised anew among the generation of young philosophers in France. In the model upheld by Sartre's existentialism it was subject and consciousness that was considered as the primary in this relationship and all forms of structure were engendered on the basis of an absolutely simple and initial determination, which was practice. In early 60's Sartre's generic philosophy lost its grip:

We were no longer in a position to believe in it. That is to say, we were no longer able to believe in the engendering of the general system of formal structure on the basis of the simple intentionalities of consciousness.[44]

The alternate approach was a commitment to structure first but to enable the structure to harbour the element of the subject. As Badiou mentions, Lacan was the one who proposed the alternative to Sartre.

I think that was Lacan's major philosophical influence. That is, the ability to bring together, in a thoroughly unusual way, a theory of formal structures, which he developed as the logical theory of signifiers, and a theory of the subjective adventure.[45]

This is a very important assertion, and for reasons that cannot be developed in this work, none of the French structuralists, and in particular Althusser, were able to make such a proposal, mainly due to their lack of commitment to the category of subject. The project that was taken up by *Cahiers* was then to elicit what was already present in Lacanian theory of the subject, something that *Cahiers* called the unified theory of discourse. This theory started by engaging in the most extreme formal rigour and by taking up the intellectual power of mathematics and logic but at the same time, as we saw earlier, showed how an element of indeterminism must be sutured and present for the proper functioning of the structure, at the center of which there are two operators of metaphor and metonymy. Badiou around this time was a member of *Cahiers* and more importantly, to his own words, completely committed to the agenda that brought this group together – to raise anew the question of the relation between structure and subject post Sartre, and although he undermines *Cahiers*' manifesto, by no means he ever abandoned the original project.

The fact is Badiou's work in this era showed one thing and that is *Cahiers* and psychoanalysis commitment to science is not thorough enough. The introduction of indeterminism and non-identity to the sci-

41 Badiou 2012-B

42 Badiou 2012-B, p.277

43 Badiou 2012-B, pp.277-278

44 Badiou 2012-B, p.278

45 Badiou 2012-B, p.278

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ence perceived as the realm of self-identity is abrupt and ideological. We will see that it is exactly by deepening this commitment to formalism and determination that Badiou finally opened the path to indeterminism and non-self-identity, of the entire situation of being. Non-identity is the law of being not of the subject.

But this path goes through tumultuous times through which praxis yet again gains a radical priority for Badiou. At the end of this era, in early 70's, the question of immediacy of praxis and the role of the subject finds a heightened urgency for Badiou, through which he comes to rethink the relation of structure and subject. And this will take us to the next part of this work.

Bibliography:

Badiou, Alain 2012-A, *Mark and Lack: On Zero*, in *Concept and Form Volume One*, Verso, Pages 159-185

_ _ 2012-B, Theory from Structure to Subject: An Interview with Alain Badiou, in *Concept and Form Volume Two*, Verso, Pages 273-290

Eyers, Tom 2013, *Post-Rationalism: Psychoanalysis, Epistemology, and Marxism in Post-War France*, Bloomsbury Academic

Hawking, Stephen 2007, *God Created the Integers,* Running Press

Lawlor, Leonard 2002, *Derrida and Husserl, The Basic Problem of Phenomenology* Indiana University Press

Miller, Jacques-Alain 2012-A, *Action of the Structure*, in *Concept and Form Volume One*, Verso, Pages 69-84

_ _ 2012-B, *Suture (Elements of the Logic of the Signifier)*, in *Concept and Form Volume One*, Verso, Pages 91-101

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Problems and Pseudo-Problems in Althusserian Science

Knox Peden

Abstract: This article looks at Louis Althusser's unpublished criticism of Jean-Toussaint Desanti's writings on epistemology in the 1960s and uses it as an inroad to discuss Althusser's ambivalent relationship to science in his own work and Marxism more generally. Confusions abound, but in the end one comes away with a fuller understanding of Althusser's polemical attitude to idealism and his partisan conception of philosophy.

Keywords: epistemology, Marxism, ideology, philosophy of science, Althusser, Desanti

In 1965, Jean-Toussaint Desanti published a two-part article titled "Qu'est-ce qu'un problème épistemologique?" – "What is an Epistemological Problem?" – in the magazine *Porisme*, a short-lived journal produced in the 1960s by the *centre nationale des jeunes scientifiques*.[1] Cognizant that the French word *épistémologie* had long been an imprecise translation of the German *Erkenntnistheorie*, Desanti set himself the task of getting beyond the tautological loop of defining "epistemology" as a "theory of knowledge" or a "theory of science." Toward this end, he identified three types of problems scientists face in their professional activity, in the hopes of identifying the problem that might properly be described as "epistemological." Problems of the first type were those that could be solved by tools internal to the given theoretical task. Those of the second type required recourse to some external, though still properly "scientific," solution, and a scientific rethinking of the problem. The problems of the third type, however, were the real epistemological problems because they called upon philosophical presuppositions extrinsic to the scientific discourse at hand. More important, these presuppositions could not be demonstrably justified – or justifiably demonstrated – by the scientific activity itself. Desanti's chief example of this tripartite phenomenon was the development of axiomatic set theory in the first decade of the twentieth century. Through a fortuitous historical-heuristic coincidence, the three tasks that the mathematician Ernst Zermelo set for himself in his efforts to axiomatize Georg Cantor's "naïve" set theory mapped on to Desanti's three types of problems: 1) to demonstrate that any set can be well-ordered – this demonstration was achieved with the tools Cantor himself provided; hence, problem of the first type; 2) to resolve Russell's paradoxes, concerning the set of all sets who are not members of themselves. Desanti argued that though these paradoxes arise from the "interior of the already theoretically constructed edifice," in this case, naïve set

1 Reprinted in Desanti 1975, 110-132.

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theory, their resolution requires rethinking the structure of that edifice. Forcing mathematicians to rethink mathematically the concept of what it means to be "well-defined," these are problems of the second type. Problems of the third type, however, only arose in this context with the controversies surrounding the "axiom of choice." The decision whether or not to "accept" this axiom pitted formalists against intuitionists. Whether or not one accepted the "axiom of choice" was contingent on one's view of the ontological status of mathematical entities. Now, Desanti's point is precisely that mathematicians did not speak or think in the language of "ontological status" but that they inadvertently called upon philosophical stakes extrinsic to the scientific problem before them to justify their own position within that problem. For a formalist, analysis itself was sufficient to demonstrate the irrefutable "existence" of a set. For an intuitionist, the assuredness of "existence" was not a result of analytical demonstration but of an intuitive grasp. As Kurt Gödel would show later, the tools inherent to axiomatic set theory were themselves insufficient for deciding this opposition. This, Desanti suggests, is truly an "epistemological problem."

On the face of it, there's nothing particularly controversial about these arguments. The title is rather innocuous compared to Desanti's earlier contributions to *La Nouvelle Critique*, the official journal of the French Communist Party. These included such gems as "Stalin: a new kind of scientist" and "Science bourgeoise, science prolétarienne."[2] But at least one reader found Desanti's claims worthy of critique, and a strident one at that. The lecture titled "Desanti and the "pseudo-problems" of the third type" was the sixth and final lecture that Louis Althusser gave in his own "Philosophy Course for Scientists" in the winter of 1967. The first four lectures delivered to this seminar were published as "Philosophy and the Spontaneous Philosophy of the Scientists" in 1976.[3] The fifth lecture, "On the Side of Philosophy" ("Du côté de la philosophie") was not included in this publication for reason that are not entirely clear. Though it remains untranslated, it is available in the second volume of the French edition of Althusser's collected writings.[4] The brief lesson on Desanti, which has never been published, was an addendum to this fifth lecture, which provided much of the groundwork for Althusser's critique of his erstwhile teacher.[5] Here Althusser had codified his claims that scientific revolutions beget philosophical ones. Galileo gives us Descartes; Newton gives us Kant; mathematical logic gives us Husserl; and Marx gives us "Marx," or better put, Althusser's Marx. More pertinent, this lecture is of a piece with the new definition of philosophy Althusser was developing at this time – this is the same period as "Lenin and Philosophy "– and which reads all philosophy as at all times marked by a conflict of tendencies, of which one is dominant. We usually think of materialist versus idealist, with Althusser following Lenin in embracing the former tendency. But in this lecture, Althusser talks mainly of empiricism versus formalism in a critique of tendencies as such. David Hume serves as an exemplar of a dominant empiricist tendency, while Leibniz exemplifies the formalist. What's striking here is the way that this oppositional framework of empiricism and formalism maps on to the mathematical opposition of intuitionists against formalists that was evident in Desanti's piece and that was common currency among those conversant with this disciplinary history. In fact, Althusser makes the link himself, claiming that "intuitionism in mathematics is an empiricism."[6] In both instances, "true existence" is conceived as the result of a kind of pragmatic grasp of a situation, eschewing conceptual integrity as its main criterion. By contrast, Leibniz, committed as he was to a mathesis universalis no less than the chief mathematical formalist David Hilbert, conceived of the true and the existent as co-extensive and, what is more, something produced or achieved rather than uncovered or discovered. And yet, Althusser faults as well this formalist extreme, linking it to "structuralist ideology." His concern is that in its putative claims to represent the object qua object – "l'objet *quelconque*" – neo-positivism, as he has begun calling it by this point in the lecture, converts the "real object," the "singular object," into the mere representation of what, as an "ideal object," lacks reality in and of itself. Thus, in their respective claims to have purchase on the "real," empiricism/intuitionism on the one hand, and formalism/structuralism/neo-positivism on the other are guilty of the same covert operation of presenting the ideal in the guise of the real. At the end of this lecture, Althusser works with a pun on the French word "voile," in two manifestations: *voilement* as veiling (typically heard in *dévoilement*, unveiling) and as *voilure*, "sail." Critically alluding to phenomenology, he calls for a concept of truth no longer beholden to the unveiling of a theretofore obscure, "real" presence, but instead for a truth as "that in which and by which the *ideological* announces itself as such." The "that" in this phrase is the sail – philosophy – in which the ideological wind blows. No stranger to travel metaphors, Althusser offers that true sailors are those who can turn the

2 The latter is reprinted in Desanti 2008, 105-133.

3 Althusser, 1990. pp. 69-165.

4 Althusser, 1997/2001, pp. 267-310.

5 Althusser, 1967 'Sur Desanti et les pseudo "problems de troisième espèce', ALT2- A12-02.01/02/03

6 Althusser 1997/2001, p. 288.

wind against itself to go in the opposite direction.[7]

So what's Althusser's problem with Desanti's account? Desanti's error, Althusser argues, is that he does not recognize that what he calls an "epistemological problem," that is, the intrusion of philosophy into science, is in fact not a rarity but a permanent situation – this is the irony after all of Althusser's concept of "spontaneous philosophy," that it is not at all spontaneous in the sense of intermittent or surprising, but omnipresent. Desanti is naïve to think that there is ever such a thing as science operating independently of its philosophical presuppositions. Desanti for his part never published a response to Althusser's critique of his position but he did express his exasperation with Althusser in a *Tel Quel* interview with Julia Kristeva in 1974. Aware of Althusser's reproach that there is no such thing as a problem of the third type, Desanti averred that he found Althusser's hostility to his position to be founded on such a degree of nonsense as to not even merit a response. All he would say was that he found Althusser's own efforts to determine – philosophically – the "scientificity" of Marx to be a perfect example of a problem of the third type, namely the intervention of philosophy to determine an intrinsic scientificity that said science is unable to legislate for itself.[8]

If it's clear that there is some real hostility here, it's also the case that the crux of the dispute between Althusser and Desanti is perplexing, given the extensive agreement between them on some core philosophical matters. Both thinkers possess a strong distrust of the phenomenological search for the fixed point with which philosophy can begin. They're equally contemptuous of the concept of origins and its correlate, the *telos*. In fact, Desanti's major work *Les Idéalités mathématiques*, published in 1968, was dedicated, among other things, to exploding the teleological framework presumed to exist of all places most naturally in the history of mathematics. Yet the main clue to Althusser's philosophical case against Desanti is located there in the title of the latter's major work: Mathematical *idealities*.[9] Althusser could not accept the way that Desanti granted "reality," or even a kind of autonomy, to mathematical "idealities." Desanti had begun that work with the observation that, since mathematical entities come from neither the heavens nor the earth, it is impossible to physically locate them, materially, even as we can be certain of their existence *as* idealities. Idealities were the practical stuff of mathematics, or, we might say, of mathematical praxis. What's curious is that Althusser understood ideology too to be neither material, nor purely ideal, but rather the domain

7 Ibid., pp. 302-03.

8 Desanti, 1975, pp. 223-24.

9 Desanti, 1968.

of activity, of a praxis. And we know that for Althusser, ideology "exists" and also possesses a measure of autonomy. So again here there seems to be more agreement than discord between Althusser and Desanti.

My point in focusing on Althusser's unpublished reaction to Desanti – and I think it's significant that it's unpublished – is to gain some further insight into Althusser's discomfort with the status of science in his own work. Althusser's relationship to science was ambivalent, deeply tied to his conviction that what Marxist theory yielded was true knowledge about the capitalist mode of production and the place of class struggle within it. But Althusser was wary of treating the "Theory of theoretical practice" or "Marxist philosophy" as a metaphilosophical stance. To do so would be to fall captive to a broadly phenomenological conception of philosophy that thought it could unify and disclose the terms of a scientific problematic from without. His hostility to Desanti is symptomatic in this regard because we can see in his reactions evidence of Althusser's struggle to develop an account of his own practice that would break decisively with phenomenology. In the lectures comprising *Philosophy and the Spontaneous Philosophy of the Scientists*, Althusser is adamant that he is not in the business of providing philosophical guarantees for scientific practice. But this raises the question of what he's doing in the first place. The series of books recently edited in France by G.M. Goshgarian, chief among them *Initiation à la philosophie pour les non-philosophes* and *Etre marxiste en philosophie*, give us further insight into Althusser's effort in the 1970s to articulate his own position on philosophy. But it behooves us to go back to this extraordinarily fecund theoretical moment between 1965 and 1968 when Althusser was keen to distinguish between problems and pseudo-problems emergent from the relationship between science and philosophy.

Before looking further at the specifics of Althusser's critique of Desanti's pseudo-problems, some comments on the broader frame are in order. In *Spinoza Contra Phenomenology*, I argue for Desanti's significance in the history of recent French Spinozism largely because of the negative role he played in Althusser's formation, both as a philosopher and a Communist.[10] Central to my claims in that book is a historical thesis concerning the conflictual relationship between Spinozism and phenomenology in France stemming from Jean Cavaillès's critical response to Husserl's work in the interwar years. I suggest that Desanti occupies an important role in this history to the extent that the conflict between these tendencies remained a live issue throughout his philosophical career. In a word, Cavaillès saw in Husserl's project the same solipsistic errors

10 Peden 2014, pp. 95-126.

that marred Kantianism, and could be traced back to Cartesianism. Chief among them was a mistaken construal of the transcendental subject as a *deus ex machina* solution to a problem it fails to address, namely the simultaneous consistency and unpredictable novelty of thought, specifically scientific thought. Cavaillès's critique was Spinozist insofar as he marshaled Spinoza's axiom "man thinks" against Descartes' "I think, therefore I am," in order to avoid the hamstringing effects of the grounding ego. In other words, Cavaillès took his inspiration from the methodological principle to be found in Spinoza's *Treatise on the Emendation of the Intellect*, which conceives of rational thought as "the idea of the idea." The key point is that the content of the nominally first idea is immaterial to the process. What is given is that there is an idea, not that there is a subject who is having it. Desanti imbibed much of this brand of rationalism from Cavaillès, his first serious teacher, so much that he embarrassed himself in a formal exchange on the subject of the "immediate" with Merleau-Ponty, his other major influence. Aping Spinoza, Desanti had concluded, "As I think myself as *Deus quatenus* I coincide with the connection and intrinsic productivity of ideas in me," [to which apparently] Merleau-Ponty raised his eyebrows in astonishment. "Desanti," he said, "it seems impossible to me that you could seriously grant any sense whatsoever to this phrase you've just said. For my part, I can't make out anything that I could possibly think as I'm hearing it."[11]

Desanti understood his own intellectual itinerary from then on to be marked by this polar tension between Cavaillès's Spinozist rationalism and Merleau-Ponty's phenomenological distrust of *mathesis*. The result, in Desanti's own words, was not so much a philosophy of the concept, which had been Cavaillès's rallying cry, but a philosophy of access to the concept. The Spinozist line in Desanti's thought is manifested most clearly as a hearty distrust of the "zero point" and the framework of transcendental structures. And yet, Desanti's methods were more evidently phenomenological in the sense that he deemed it his task to excavate the experience of "sense" per se, and to question any concept – such as *Deus quatenus*, or its correlate, *Deus, sive Natura* – whose content could not be adequately conceived, or "accessed," in the mind. Desanti's oeuvre is in fact maddeningly elusive because of this tension in his work (It's also excruciatingly technical – *Les Idéalités mathématiques* has virtually no audience. The math is advanced, and the phenomenological language is completely esoteric to the mathematician.)

Nonetheless, Desanti was a conduit for the Cavaillèsian version of Spinozism in French thought. In the later 1940s, Desanti ran a series

11 Desanti 1993, p. 114.

of unofficial seminars at the ENS to reacclimatize those students whose educations had been interrupted by the Second World War. Althusser was among his students. In Althusser's archive we have his 1948 notes from Desanti's lectures on Spinoza. In addition to Spinoza's materialist tendencies, we see the contours of a Spinoza whose rationalism is devoid of origins or goals, and is in essence a rationalism of the concept, a redress for all sorts of problems, epistemological *or* ideological.[12]

So if Desanti was an important influence on Althusser why is he so derided in Althusser's memoirs? Here the history becomes both personal and political. Desanti, along with his wife Dominique, had become a member of the PCF during the Second World War at the peak of his Resistance activities. In the postwar years, the Desantis were among the most vociferous advocates of a hardline Stalinism in the French context. Of all of the official Party intellectuals, Desanti clearly had the most viable philosophical credentials. In the late 1940s, he, along with Jean Kanapa and Laurent Casanova, played a role in recruiting Althusser into the Party – this is not to deny the validity of Althusser's own narrative of these events, which emphasizes his wartime experiences, and the friendship of Jacques Martin, but only to point out the practicalities of the situation. Desanti brought Althusser into the fold. There is also some complicated personal history here, surrounding the Desantis' efforts on Althusser's behalf to secure his partner Helene Legotien's readmittance to the Party and their failure to achieve this end.

The family dramas of the PCF are not our concern. More important, though still in its way personal, is the role of philosophy. Whenever Althusser takes Desanti to task in his memoirs, it is usually coupled with some lamentation of Desanti's commitments to Husserl. For example: "[Tran Duc]Thao and Desanti carried the hopes of our generation, as did Desanti later. Husserl was to blame for the fact that they did not fulfill them."[13] In some private notes on Desanti's *Phénoménologie et praxis* – a primer on what Communists need to know about phenomenology published in 1963, drawn from Desanti's course on Husserl's *Cartesian Meditations* – Althusser wrote: "what's ridiculous about Touki [Desanti] is that he still believes in the possibility of Husserl's project. And that all he charges him with is being unable to keep his promises, as if his only vice were one of weakness!"[14] Here we approach the heart of the matter. Well before Althusser criticized Hegel, or Hegelianian Marxism, in the name of Marx, Althusser recognized that phenomenology was unacceptable as

12 Althusser 1948.

13 Althusser 1993, p. 328.

14 Althusser [1963?].

philosophy because its foundations were intrinsically solipsistic. Phenomenology was in error precisely because of the rampant subjectivism it countenanced, a subjectivism insured by the well-nigh enshrinement of the ego, however mediated, as the source of knowledge. Desanti himself seemed to recognize this error of Husserl's project. For Desanti, no less than Cavaillès, in the end phenomenological foundations could not be justified without a kind of leap into the irrational. But he maintained that aspects of the method were salvageable, shorn of their ontological ambition. Althusser would have none of it. His intransigence once he began his project in earnest of recuperating Marxism was rooted in a philosophical conviction with broader scope, namely the urgency of recuperating *science* as such from the denigration it suffered in the hands of phenomenologists *and* Stalinists.[15]

For Desanti was not only a Stalinist in his politics, he also produced some of the most egregious propaganda to come from the pen of a *normalien*. I've already referred to his piece "science bourgeoise, science proleterienne," which was a contorted defense of Lysenkoism, itself the "scientific" source of the Soviet Union's disastrous agricultural policies. In the introduction to *For Marx*, Althusser refers to the recent history of French communism, "summed up in a caricature by a single phrase, a banner flapping in the void: 'bourgeois science, proletarian science.'"[16] The reference here is to Desanti and the travesty of the "two sciences." In Althusser's view, the human cost of Stalinism was plainly evident. What needed to be thought was this manipulation of science, which gave the operation its veneer of necessity. Science, this feat of human activity, had become a "caricature" under Stalinism; a caricature whose essence was the manipulation of so-called "science" in the name of ideological ends. The fact that it was Desanti who most visibly defended this vision of science in the French context was not unrelated to Desanti's phenomenological proclivities, in Althusser's view. For Althusser, phenomenology, with whatever proper name you want to attach to it, from Feuerbach to Husserl, signaled the ultimate squandering of the rationalist, impersonal potential of science in the name of a blinkered ideological, or "spontaneously philosophical" agenda.

But the story does not end here, with Althusser the victorious celebrant of science declaiming against the ideological Desanti. For Desanti did ultimately leave the Party in the late 1950s, and his break was unequivocal. He returned to the "epistemological" concerns of his youth, and the article "what is an epistemological problem?" was one of the first

15 Peden 2014, pp. 127-148.

16 Althusser 1969, p. 22.

forays in his "second" post-Stalinist career, over the course of which he consistently challenged philosophers for their recourse to science as an alibi for philosophical concerns. Wittingly or not, philosophy looks to science for its foundations, even as it evinces its superiority. But in its borrowing of scientific foundations, philosophy changes the content of those very foundations, imputing to them an ontological grounding function not warranted by the science itself. This is why Desanti wants to preserve a notion of science as possessing an autonomy that works better without the static interference of philosophy. When "philosophy" starts intervening, this means the science itself needs to back up, reconsider itself, and renew its energies. It needs, in a key phrase of Desanti's to be, "remis en chantier," which we could plausibly translate as going "back to square one or the drawing board," but literally means returned to the state of a work site. In any event, the best the epistemologist or philosopher can do is to designate these sites of tension when they arise and initiate the "remis en chantier." Above all, it is not his task to short circuit science itself, by deciding its problems for it "philosophically."

This, in Desanti's view, was the ultimate sin of Althusserianism, arrogating for its own philosophical mission the aura of a scientificity that was dubious in the first place. Ultimately, then, the tables turn and Althusser becomes a target of Desanti's charges of manipulating science just as Althusser had charged Desanti of the same duplicity before. As ever in philosophy, what you have are antagonists accusing each other with the same charge. For what it's worth, Rancière treats Althusser's take on Desanti as a "strange reading," with Althusser imputing to Desanti a view about philosophy's relationship to science that wasn't his. Regarding scientific crises, Rancière writes, "neither the concept nor its problematic is to be found in Desanti. Althusser had to put them there to be able to chase them out while arguing that sciences so dishonestly exploited were in need of a vigilant assistant"[17] (*Althusser's Lesson*). It's clear that Desanti did not keep abreast of the finer points of Althusser's development on this issue. But it's also undeniable that Althusser's reading of Desanti is tendentious at best. This should be indicative for us; it invites to consider further what's motivating Althusser in this case. With this in mind, let's return now to Althusser's argument that what Desanti thinks are problems are in fact pseudo-problems.

Recapitulating Desanti's tripartite distinction, Althusser says problems of the first type are problems of "theoretical production" and those of the second are problems of "theoretical revolution." In the first case, the resolution of the problem takes place entirely within the terms

17 Rancière 2011, p. 66.

of a given theory. The theory itself is in no way reworked. Problems of the second type require revision of the theory itself; a classic case in point is the revision of physics by Newtonian theory. Problems of the third type are those that arise when a science is in "crisis" – this is Desanti's term. And the only way they can be resolved, as I noted before, is by the introduction of semantically foreign concepts. Desanti's two examples are the question of the "existence" of mathematical objects in set theory and the problem of "indeterminism" in post-Einsteinian physics. In both cases, philosophical concepts are imported to adjudicate scientific problems. Desanti thinks such a move is unwarranted; the science should strive in all instances to avoid philosophical recourse and the seductions of semantic closure.

Desanti's agenda of protecting science from philosophical decision should, it seems, appeal to Althusser. So his reaction creates something of a puzzle. Why does Althusser think that these problems of the third type do not really exist? Why does he term them pseudo-problems? He's categorical. He writes: "there are no 'problems of the third type'. There is no 'scientific crisis'. There are only little philosophical crises among scientists on the occasion of certain difficulties."[18] He thinks that Desanti, like most traditional philosophers, seizes upon the idea of scientific crisis and inflates it for philosophical ends. In Althusser's vision, Desanti remains very close to Husserl in that he treats the sphere of scientific thought as an ideal domain in which certain epistemological problems arise. The tendency toward discursive, theoretical idealization is what Althusser is attacking here. In conclusion, he writes:

> *Philosophy is an organic part of the conditions of the process of production of scientific knowledges*. In order to find philosophy in the sciences, we must go look for it *there where it is*: not in the "philosophical crises" of the scientists, but in *the conditions of the process of production of scientific knowledges*. If scientists refuse to look for it, there where it is, *in this precise place*, if they think that what they "see" in their scientific practice constitutes the last word on the conditions of the process of production of scientific knowledges, *they are wrong*. The philosophers who align themselves with this view share the error of the scientists. In his article, Desanti is in this camp.[19]

18 Althusser 1967.

19 Althusser 1967.

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These charges acquire added pathos when we consider Althusser's treatment of Desanti as emblematic of Lysenkoism and the Stalinist manipulation of science. By returning to a focus on the materialist conditions of knowledge production, Althusser seems to be veering back on to this shaky ground himself. If all scientific problems are conditioned in the last instance by the material conditions of their production, this brings us back to the idea that science has a class character. So the burden is on Althusser is to articulate what distinguishes his materialist conception of science from an argument for the "two sciences," one proletarian and one bourgeois.

Here a key document is Althusser's introduction to Dominique Lecourt's analysis of the Lysenko affair. In this polemical text, penned in 1976, at roughly the same time that Althusser was drafting the texts recently edited by Goshgarian, as well as the *Soutenance d'Amiens*, which stands as the main statement of his views in this period,[20] Althusser comes back to the set of issues emergent from his response to Desanti. Reflecting on the nature of error and the failure of the Soviets to deal adequately with their error by giving it a properly Marxist analysis, he writes, "It is in the class struggle that the proletariat comes to disentangle and confront the relations of forces in which it is enmeshed, and succeeds in defining the 'line' of its struggle. None of this resembles the clarity of a case in which a pure consciousness confronts the pure clarity of a situation."[21] This latter is the conceit of phenomenology, which imagines scientific crises to take such a form. The correction of error in this staging requires the fiction of an objective or somehow ontologically prior truth that could be clarified with recourse to the structures of an objectively conceived subjective consciousness. Alternatively, Althusser, following Lenin, calls for the paradoxical situation in which the Marxist confronts "*error without truth* and *deviation without a norm*."[22] To persist in this paradox is to refuse concession to any notion of ontological ground on which such matters could be adjudicated. "The dominant version of dialectical materialism," Althusser writes, "transforms materialism into an ontology of matter whose 'laws' are supposed to be stated by the dialectic." This is a "version which refuses to recognize that the whole virtue of materialism and of dialectics lies in the fact that they state not 'laws' but *theses*."[23]

These claims help us understand better Althusser's charges

20 Althusser 1990, pp. 205-240.

21 Lecourt 1977, p. 9

22 Ibid., p. 10.

23 Ibid., p. 14.

against Desanti. In working with the concept of scientific crisis that he does, Desanti operates in an idealist version of the earlier ontological materialism in which he himself was complicit. In other words, he has returned to and made explicit the idealist commitments that were already the compromising elements in a dialectical materialism that remained, in a word, idealist. This gives us a sense of what Althusser means by pseudo-problems. Pseudo-problems are those that are treated as capable of resolution by idealist gestures. They are problems that are conceived as being of a scientific nature yet capable of philosophical resolution. Desanti had grievances against such a position, but he treated it as a viable or extant position nevertheless, in the sense that it was something that actually took place in the history of sciences. Althusser cedes nothing in this regard. In *Etre marxiste en philosophie* he writes, "If one wants to be initiated into philosophy, one must know above all that *philosophy is not a science*, thus that philosophy does not pose problems like the sciences and nor does it discover their solutions, which are knowledges, like the sciences – but that philosophy is instead a *wholly other practice* which poses questions and gives them responses, without these responses being knowledges as in the case of scientific knowledges."[24] (84). Philosophy has no object. Thus there is no object for it to know. "Everyone will admit that science has an object. But that each science has a limited object is a proposition that is much less recognized. And yet it is totally essential to the intelligibility of the sciences and their history."[25]

Breaking with Lenin's pronouncement on this score, Althusser will eventually come to insist on the limited domain of Marxist science – it is not all powerful, but pertinent only to a specific object, history conceived as class struggle.[26] This is what it means, ironically, to be a Marxist in philosophy. It is to break with any notion, which is dear to phenomenological idealism however ramified, as in the case of Desanti, that thinks one can escape a partisan – and hence inevitably partial – stance on a discursive or practical field. In his unpublished piece on Desanti, Althusser writes: "[the term] 'problem' designates by its name a precise reality unique to a scientific practice."[27] One is reminded here of Marx's remark that humans only set themselves tasks they have the capacity to solve. Such problems are only solvable in practice and with an awareness of the limited domain in which they obtain – which means solving problems raised by class exploitation cannot be achieved by means that fail to address this antagonism directly. But it follows too that solving these problems means that other problems – other injustices – will remain. To think otherwise is not simply to offer pseudo-problems, but pseudo-solutions.

24 Althusser, 2015, p. 84.

25 Ibid., p. 85.

26 See, e.g., 'Marxism Today' in Althusser 1990, pp. 269-80. Compare 'Marx in His Limits' in Althusser 2006, pp. 7-162.

27 Althusser 1967.

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Bibliography

Althusser, Louis 1948, 'Notes Sur Spinoza (2)', unpublished, in ALT2. A60-09, Fonds IMEC, Caen.

-----[1963?]. Notes retrouvées *Phénoménologie et praxis* de J.-T. Desanti. 2ff : 1 ms + dactyl, unpublished and undated, ALT2. A58-02.04, Fonds IMEC, Caen.

-----1967, 'Sur Desanti et les pseudo "problems de troisième espèce', unpublished, in ALT2-A12-02.01/02/03, Fonds IMEC, Caen.

-----1969, *For Marx*, trans. Ben Brewster. London: New Left Books.

-----, *Philosophy and the Spontaneous Philosophy of the Sciences and other essays*, ed. Gregory Elliott, London: Verso.

-----1993, *The Future Lasts Forever*, trans. Richard Veasey. New York: The New Press.

-----1997 [poche 2001], *Écrits philosophiques et politiques,* tome II, Paris: STOCK/IMEC.

-----2006, *Philosophy of the Encounter: Later Writings, 1978-1987,* ed. and trans G.M. Goshgarian, London: Verso.

-----2015, *Être marxiste en philosophie*, ed. G.M. Goshgarian, Paris: PUF.

Desanti, Jean-Toussaint, *Les Idéalités mathématiques: Recherches épistémologiques sur le développement de la théorie des fonctions de variables réelles*, Paris: Seuil.

-----1975, *La Philosophie silencieuse, ou critique des philosophies de la science*, Paris: Seuil.

-----1993, 'Spinoza et la phénoménologie', in *Spinoza au XXème siècle*, ed. Olivier Bloch. Paris: PUF.

-----2008, *Une Pensée captive: Articles de La Nouvelle Critique (1948-1956),* ed. Maurice Caveing, Paris: PUF.

Lecourt, Dominique 1977, *A Proletarian Science? The Case of Lysenko*, trans. Ben Brewster, Introduction by Louis Althusser, London: New Left Books.

Peden, Knox 2014, *Spinoza Contra Phenomenology: French Rationalism from Cavaillès to Deleuze*, Palo Alto, CA: Stanford University Press.

Rancière, Jacques 2011, *Althusser's Lesson*, trans. Emaliano Battista, London: Continuum.

Marxism, Science and Technology

Katarina Peović Vuković

Abstract: This paper discusses a relationship between humanities and science, specifically the relationship between Marxist philosophy and so called STEM disciplines and informatics. On the one hand social sciences and humanities are more than ever dependent on science, skills, pragmatic aims and applications of all sorts. On the other hand, there exists concrete form of scientific Marxism – such as Paul Cockshott's theory – which uses bit data tools showing how the same scientific approach can be used differently. Such uses of the technology and scientific achievements of the era shows specificities of Marxist philosophy. Althusser already described such specificities and Marxism as a new science, the science of history. The rupture with the interpretative philosophy is also to be found in scientific Marxism. This work also locates form of new primitivism and anti-scientific orientation of certain Marxism's – dangerous fatalism and technological determinism that blocks any positive approach to science and technology. At the same time, it also shows dangers of "moving with the flow" - technooptimism - blind for the political and economic hegemonies cloaked in scientific and technological progress. The former is explicated already in Walter Benjamin. Marxism and its epistemological break with philosophy on the one hand and science on the other, is finally reduced to distinction between Heidegger and Marx, distinction proposed by Alain Badiou who describes it as a difference between "poem" and "matheme."

Keywords: Marxism, Althusser, STEM, digital humanities, historical materialism, new primitivism

> "Communist militants must assimilate and use the principles of the theory: science and philosophy."[1]

Introduction. Science and philosophy today

The distinction between science and philosophy can be superficial. Is it even possible to distinguish (natural) sciences from humanities? There always exists certain social context that saturates science. Philosophy and other humanistic disciplines are related to scientific and technological achievements of its era. Scientific community supplies science with "know how". Thomas Kuhn described how research is always based upon one or more past scientific achievements, and that such achievements in "some particular scientific community acknowledges for a time as supplying the foundation for its further practice"[2]

1 Althusser 1971, p. 14.

2 Kuhn 1962, p. 10.

Scientific practice is related to social practices, behaviours, believes – former being (sometimes) the essential part of science, and indistinguishable from one another. The traditions which the historian describes under such rubrics as 'Ptolemaic astronomy' (or 'Copernican'), 'Aristotelian dynamics' (or 'Newtonian'), 'corpuscular optics' (or 'wave optics'), and so on are actual scientific practices from which "spring particular coherent traditions of scientific research"[3]. That scientific practice which Kuhn calls the "normal science" includes law, theory, application, and instrumentation of historical specificities – in short the "paradigm"[4].

Science and humanities are not so distant, since object of humanities' research are integral part of science. The objects of humanities' research and not some marginal elements or supplements, but (sometimes) unwritten laws and specificities of the scientific paradigm that play major role in forming the science.

On the other hand, social sciences and humanities are more than ever dependent on science, specifically technical and natural sciences. Humanities and social sciences today lean towards "STEM disciplines" – science, technology, engineering and mathematics. It is mostly because STEM become politically important. STEM is not neutral term that refers to few disciplines but it is used to refer also to education policies that push humanities and science in global toward applied sciences, skills oriented knowledge and "pragmatic" aims. Redirection towards skills and application is accompanied with marginalization of social sciences and humanities since such transformation is primarily focused on creating and maintaining flexible work force and adapting workers to turbulent labour markets. Learning outcomes are structured according to requirements of the global marketplace. New disciplines emerge such as digital humanities – offering a cohabitation of humanities and science.

Digital humanities combines humanistic disciplines, such as anthropology, history, linguistics, literary theory, philosophy, etc. with STEM fields, mostly informatics and mathematics. Digital humanities force the uses of big data tools. Big data is a format of collecting information that allows more approachable representation of large and complex data sets. In 2008 Lev Manovich, one of the most prominent scientist in this field, announced that we are entering the "Petabyte age", where our ability to handle massive data sets will be increased.[5]

Big data is unquestionably useful tool, however, it is fetishistic technologicaly-oriented model, where technology is transformed from a tool of analyses into its purpose. The true motif of this pragmatic turn lies in the political-economic determinations that marked a larger turn in the humanities. The transition is accompanied by increasing orientation toward entrepreneurial and pragmatic knowledge and empirical outcomes. Digital humanities are mostly founded from private corporate funds.[6] The research is being replaced by mere usage of technology in the hands of corporations. (For example, one of the most important annual conference in digital humanities is funded by Volkswagen Stiftung.[7]) At some point software studies and other fancy disciplines produce nothing more than lovely pictures (big data is usually graphically represented). That way big data function more as a symptom than a tool of the "Petabyte age".

Digital humanities offer a perfect example of such interdisciplinarity that, in some aspects, provides a picture of politically transformed and often damaged disciplines that are however motivated by, at the first sight, positive urge to push the knowledge in the direction of human needs. First of all, those needs are described through the applicability and unbiased understanding. One of the most influenced tools of digital humanities – big data – will be addressed later. However, it is important to provide a framework for different relationship between humanities and new tools, such as big data – since those tools today function not only as tools of divide (between humanities and science) but also as tools of connection, specially in the hands of socialists and Marxists.

Marxism and Science

Since its beginning, Marxism had a profound relationship with science. It is not a standard relationship between one scientific discipline and science in global. Althusser saw Marxism as an unprecedented revolution in the history of human knowledge. He claimed that Marx founded a new science, or as he calls it time and again, a 'scientific continent': the science of history[8]. It is not a new philosophy, writes Althusser but precisely the science of history, rupture with all 'interpretative' philosophy, something quite different - announced in the *Theses on Feuerbach*, and earlier in *The German Ideology*. "It is essential", says Marx in that work, "to get rid of all philosophical fancies and turn to the study of positive reality, to tear aside the veil of philosophy and at last see reality for what it is."[9] It is "real history of concrete men", "history of the material life of men", where science is seen as "the real itself."[10] It is Marx who "replaced ideological theories with a scientific theory" which means that domain "previously

3 Ibid., p. 11.

4 Ibid., p. 11.

5 Manovich 2013, p. 9

6 Cvek 2014

7 See https://www.volkswagenstiftung.de/digitalhumanities.html

8 Althusser 1971, p. 37.

9 Ibid., p. 37.

10 Ibid., pp. 37-38.

monopolized by philosophies of history" is now organized in a theoretical system of scientific concepts[11].

Marxist-Leninist theory functions both as science and philosophy, since it stresses the difference between the two, and finds the way to transcendent such difference. This means that historical materialism invents scientific understanding of the history, it functions as first scientific history, while on the other hand dialectical materialism allows philosophical understanding of determined materialistic course of history. Although some leftist deviations tended to suppress science while focusing on philosophy,[12] Marxism succeed in transcending the difference. After Marx, Lenin established philosophy and what have been repressed for a long time – politics. Politics combines science and philosophy – historical materialism and dialectical materialism.

Marxism today also have a profound relationship with science. Often, it is unconsciousness relationship – naturalised relationship with science, positive or negative, and not elaborated in Althusser manner. Is there a pattern of such relationship as digital humanities offers a pattern and conscious elaboration of the domination of science over the philosophy of historical and dialectical materialism? How contemporary Left interprets the role of science and technology in its political and economic program? Is there a problem of the communist fidelity to the proletarian position that often involves an unambiguous rejection of technology and science as already "polluted" by capitalism? The same rejection of science often turns out to be a return to "kind of prelapsarian substantial unity,"[13] as in case of Evo Morales, current president of Bolivia. Morales spoke about Mother Earth's illness and importance to reject the fruits of the industrial revolution "which gave birth to the capitalist system"[14]. Morales, in his blueprint of future society expresses serious doubts that science and technology can accompany socialist and communist society.[15]

The industrial revolution already marked political and economic fall. However, can we say that the problem of the modern civilization lies in the technological and scientific progress? Modern times elevated our lives, live expectancy today is higher, technology certainly made our live easier.

Existing essentialist view of "destructive science" forces us to rethink again the relationship of science and Marxism, or more precisely the relationship between science and capitalist mode of production founded

11 Ibid., p. 39.

12 Ibid., p. 13.

13 Žižek 2009, p. 96.

14 Ibid., p. 96.

15 See http://www.worldfuturefund.org/Projects/Indicators/motherearthbolivia.html

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on the exploitation of subordinated class. Certainly there are different forms of Marxism from Hegelian tradition – around the Frankfurt school, to historical materialism, which is particularly active in France (Althusserian school) and finally the group of analytical Marxism - which attests to the influence of Marxism in Anglo-American culture.[16] There are different accompanied views on the subject of science and technology. However, there is one Marxist theory that truly recalls initial Marx stance on this issue. Such view, at the same time, transcends problems present in neo-primitivism and Evo Morales's view.

Paul Cockshott's scientific Marxism

British Marxist Paul Cockshott rethinks the role of the science and technology, specially STEM disciplines which he sees as tool of progressive thinking. Cockshott claims that "the new information technology permits a direct transition to communist mode of calculation". The new communist relations of production will abolish class differences and allow technical and humanitarian progress to resume.

Before elaboration of such view, in order to arrive to the question on how Marxism and STEM can combine, it is important to pose initial question: "What communism stands for today?" What would be the minimal steps for introducing new form of economy and new form of society? Paul Cockshott & Allin Cottrell in their Marxist study *Towards a New Socialism* advocated an abolition of wage system. Following Marx, they write:

> "Equal pay is a moral statement. It says that one person is worth as much as any other. It says, 'Citizens, you are equal in the eyes of society; you may do different things but you are no longer divided into upper and lower classes.' Talk of equality of educational opportunity is hollow so long as hard economic reality reminds you that society considers you inferior. Beyond what it buys, pay is a symbol of social status; and a leveling of pay will produce a revolution in self-esteem. Increased comfort and security for the mass of working class people would be accompanied by a rise in their expectations for themselves and their children."[17]

The real-existing socialisms failed in such transition. The history of socialisms did not result with the transition to communism. Paul Cockshott in an article "Big Data and Super-Computers" analyses such inability of 20th century socialism to progress to communism and shows how it is

16 Bidet & Kouvelakis 2008, pp. 369-370.

17 Cockshott & Cottrell 1993, p. 30.

a result of the essential failure of socialist countries, first of all USSR, to progress from economic to social change. During Khrushcev's era communism downplayed social change and identified communism with achieving exponential growth. It is well known that USSR communism was seen in terms of "quantity of output", electrification, which was "the pivot of the economic construction" of that society. Already in 1990 USSR was "doing better than the leading European capitalist countries."[18] Not only electrification but also food production was doing better, at the same time it did not create a context for transition to communism. At the same time, Cockshott sees development of informational technologies as new possibility for such change.

Today's technical and scientific advances allow us to remove old objections to communist economics.[19] Von-Mises and Hayek believed that only market can control production. Von-Mises saw that "only money provides a rational basis for comparing costs" and that "calculation in terms of labour time is impractical."[20] It is because of the millions of equations that would needed to be solved. However equations today must only be extrapolated from the Net. Similarly, Hayek claimed that only market can solve problem of dispersed information. But to work out the labour content of every good only requires the solution of millions of equations – which is today possible. In 1960s computers were not powerful enough, while it is also notable that in USSR no particular attention was paid to information technology as an enabling technology for communism.[21]

Internet allows "real-time cybernetic planning", big-data "allows concentration of the information needed for planning", super-computers "can solve the millions of equations in seconds" and electronic payment cards "allow replacement of cash with non transferable labour credits."[22] Such technological advancements resolve the problem of social transition as fundamental problem of communism.

Paul Cockshott with Karen Renaud showed practical uses of big data and the Internet in extending democracy and handling economic decisions. They demonstrated how digital technology can be applied in national budgeting. In their paper they presented a system which allows maximal participation, using a ubiquitous input mechanism, the mobile phone, to support decision-making.[23] The current situation is that governments are reluctant to conduct plebiscites due to the expenses

18 Cockshott 2017.

19 Ibid.

20 Ibid.

21 Ibid.

22 Ibid.

23 Cockshott, Paul & Karen Renaud, 2010.

inherent in the traditional voting model. However, technology surpasses financial obstacle. The plebiscites Cockshott and Renaud focused on generally have yes/no alternatives such as: • Should smoking in public be banned? • Should the UK get out of the Afghan war? • Should Scotland be independent?[24] In short, Cockshott's view replaces prejudices on science and technology, and allows positive Marxist answer to the question of how science can assist to introduce new form of a society.

Negative role of science and technology. Badiou, Heidegger and Marx

If Marx invention announced in the *Theses on Feuerbach* was, in the necessarily philosophical language a declaration of rupture with all 'interpretative' philosophy, something quite different from a new philosophy, if this was "radical suppression of philosophy", while the philosophy presented a hallucination and mystification; if everything which seems to happen in philosophy really happens outside it, in the only real history, the history of the material life of men, and if Marxism presents an "epistemological break"[25] what is the model of such science? Is it the "continent of Mathematics" starting with the Greeks (by Thales or those designated by that mythical name) and the continent of Physics (by Galileo and his successors)"?[26] Or is it a science like chemistry, or a science like biology, or the science of history?[27]

There exists new primitivism which suppresses the possibility to integrate science and Marxism. On the other hand, Paul Cockshott offers integrated model of science and Marxist philosophy. However, there is profound political problem with STEM disciplines and science as a whole. Science in capitalism is determined by capitalist mode of production. Science functions as an instrument of capital and determined by science.

Potentials of modern science is shadowed by its political and economic role. Although it seems that contemporary discourse can make no claim to totality, the computerization of society, which shifts emphasis from the ends of actions to their means, has made metanarratives (as a means of legitimizing knowledge) unnecessary and intolerable because technology is self-legitimating.[28] Since at least the end of the 1950's scientific knowledge present a dominant type of discourse. Knowledge is and will be produced in order to be sold and consumed since the goal is

24 Ibid., p. 1.

25 Alhusser 1971, p. 39.

26 Ibid., p. 40.

27 Ibid., p. 40.

28 Lyotard 1979.

exchange.[29] Knowledge ceases to be an end in itself, it loses its "use-value". Lyotard even argues that hegemony of the computers – brings certain logic, defines what the knowledge is, while the status of knowledge is altered as societies enter postindustrial age and culture enter postmodern age.

However, initial Marxist stance on this issue is affirmative. And Paul Cockshott's example shows how Marxism today can reproduce a scientific relation to history. Is it not initially the problem already exposed in philosophy? The role of science and technology is dominant theme of Heideggerian poetico-natural orientation, which lets-be presentation as non-veiling, as the authentic origin.[30] For Heidegger's poetico-natural philosophy – the epoch is ruled by an inaugural forgetting. Technology is detected as the main problem of modern times. Heidegger elevates the science and technology to the level of ontological inquiry. Heidegger sees technology as a way of revealing.

He proposes a Greek return in his deconstruction of metaphysics[31]. For Heidegger there is a typical "technological nihilism" and nostalgia related to "return to Gods."[32] It is questionable if the ontology as native figure of Western philosophy can be "the arrival of the poem in its attempt to name"[33]. Alain Badiou proposes such dichotomy as the difference between poem and matheme. In philosophy the conflict is already staged between Heidegger's critique of an epoch and Marx's philosophy of practice.

For Marx there is no nostalgia or nihilism. There is an importance of rupture and accompanied science of historical materialism that Marx proposes and its approach to science as annunciation of the end of philosophy and its realization in practice. In establishing such distinction Badiou founds a doctrine of what, for thought, both un-binds the Heideggerian connection between being and truth and institutes the subject, not as support or origin, but as fragment of the process of a truth.[34] There is a need to think about Nature and technology in different way. Nature is not a region of being, a register of being-in-totality. It is the appearing, the bursting forth of being itself, the coming-to of its presence, or rather, the 'stance of being'.[35]

29 Ibid., p. 45.

30 Badiou 2005, p. 125.

31 Badiou 1992-93.

32 Ibid. p. 56.

33 Badiou 2005, p. 125.

34 Ibid., p. 15.

35 Ibid., p. 123.

Benjamin and technological determinism

There is also another Marxist view – a critical one, but less essentialist. In his essay "Thesis on the Philosophy of history" Walter Benjamin writes:

> "Nothing has corrupted the German working class so much as the notion that it was moving with the current. It regarded technological developments as the fall of the stream with which it thought it was moving. From there it was but a step to the illusion that the factory work which was supposed to tend toward technological progress constituted a political achievement."[36]

The progress can be a powerful tool in the hand of socialists. However, as Benjamin writes on how parcel of Social Democracy shared what he called "vulgar-Marxist" view which define labour by relating it to technological development. Burdened with economic determinism this fraction of the party saw labour as a necessity of the progress, and progress as something natural, positive and undisputed. Such scientific progress sees labor as "the source of all wealth and all culture."[37] Why it is something problematic in defining labour as necessity of positive development? For Benjamin it is problematic since such concept of the nature of labor bypasses the question of "how its products might benefit the workers."[38]

Marx in *Capital,* on the chapter called "Machinery and Large Scale Industry" discusses the progress of machinery which he sees as, first of all, a class conflict, while development of production forces he described as accompanied by class antagonism. It would be possible Marx observes, "to write a whole history of the inventions made since 1830 for the sole purpose of providing capital with weapons against working class revolt."[39] For Marx, labour is not natural companion of a progress – on the contrary. Factory owners relentlessly transfer workers' skills into technological systems. Progress of machinery in the hands of capitalists does not aim to free worker from labour, but to instrumentalize machinery for the purpose of the capitalist in order to "depend less on labour time and on the amount of labour employed" than on "the general state of science and on the progress of technology."[40]

The same vulgar-Marxists notion of neutral progress is encountered later in Fascism. Both share the same vision of what Benjamin

36 Benjamin 1968, p. 258.

37 Ibid., p. 259.

38 Ibid., p. 259.

39 Marx 1976, p. 563.

40 Dyer-Witheford 1999, p. 5.

called the imperative of "the mastery of nature" as a tool in the hands of the few.[41] Marx also saw development of machinery as positive thing – as a form of reduction of necessarily labour time. Consensus on linear progress of technology accompanied by labour and working force as its natural companion is deathly weapon of today's ideology. Technological determinism is an illusion that technological progress constitutes political achievement. But what is political achievement? What can be characterized as such?

Conclusion

As we saw in Paul Cockshott example scientific progress can be powerful tool in the hands of political and economic progress, but also a tool of stagnation in political and economic sense. Such is the case of digital humanities – discipline that promotes uses of new technology, specially big data technology (used also by Cockshott). The aim of digital humanities, according to its promoters, is to invent new ways of research or to approach culture in "a radically new way."[42] Frederic Jameson diagnosed perpetual present responsible for status quo: "Capitalism itself lives in a perpetual present."[43] Inventing a fetish in the form of big data, or another representative tool, does constitute an epistemological frame for continuous present. The digital humanities' invention of new forms of representation must be seen not only as a fetishist gesture, but also a tendency of capital to generate new forms of profit. Digital humanities are orienting science toward entrepreneurial and pragmatic practical knowledge defined by "concrete," practical, empirical outcomes.

Digital humanities as other disciplines fall under the misconception of linear technological progress common to different political universes. Today's precariat workers are working more hours than the savages in primitive community.[44] However, a consensus on 'moving with the current' is live and strong.

Not only traditional and conservative, but also revolutionary theories are locked in the notions of political potential of new media as communicative channel that has the ability of creating a public sphere in which debate and political planning can take place. But is it not the Arab spring the ultimate example of how insisting on the public sphere as a topos of change – serves classical neoliberal ideological agenda? In other words, let them talk what ever they like, as long as they do not come to close in changing the way of production and reproduction of social life. (In other words truly revolutionary actions would be nationalization of banks, installation of self-management system, in short - discarding all elements of capitalist political economy.)

Although science in capitalism is determined by capitalist mode of production, and science functions as an instrument of capital, there is profound difference between science for itself a science as such – similarly to what Marx distinguishes as class as such and for itself.[45] In the same manner in which mass is a class as against capital, but not yet for itself, the science can be against capital but not immediately and naturally. As "the struggle of class against class is a political struggle",[46] the struggle of science against science is a political struggle. That means that Paul Cockshott's uses of big data is Marxist answer to essentialisation of science and politics – an answer to simplifications that differentiation between science and society. As science can be used against society, it can be used for society.

41 Benjamin 1968, p. 259.

42 Berry 2011.

43 Jameson 1976, p. xiv.

44 Pavelski 2013.

45 Marx 1999

46 Ibid p. 79

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Bibliography

Althusser, Louis 1971, *Lenin and Philosophy and other essays*, trans. Ben Brewster, New York and London: Monthly Review Press

Badiou, Alain 2005, *Being and Event*, trans. by Oliver Feltham, New York and London: Continuum

_____ 1992, *Manifesto for Philosophy*, New York: State University of New York Press

_____ 2015, *Nietzsche. L'antiphilosophie I. 1992–1993,* Paris: Fayard

Benjamin, Walter 1968, "Theses on the Philosophy of History", *Illuminations*, New York: Schocken Books, pp. 253-264

Bidet, Jacques & Stathis Kouvelakis 2008, *Critical Companion to Contemporary Marxism*, Leiden & Boston: Brill

Cockshott, Paul 2017, "Big Data and Super-Computers: foundations of Cyber Communism", *Paul Cockshott's Blog. Comments on economics and politics*, https://paulcockshott.wordpress.com/2017/07/24/big-data-and-super-computers-foundations-of-cyber-communism/

Cockshott, Paul & Allin Cottrel 1993, *Towards New Socialism*, Nottingham: Spokesman

Cockshott, Paul & Karen Renaud 2010, "Extending Handivote to Handle Digital Economic Decisions", ACM-BCS Visions of Computer Science, 2010 International Academic Research Conference, 14-16 April 2010, Edinburgh, UK, http://eprints.gla.ac.uk

Cvek, Sven 2014, "Digital Humanities between Technology and Labour", Working Papers in American Studies, Croatian Association for American Studies, 46-61

Dyer-Witheford, Nick 1999, *Cyber-Marx. Cycles and Circuits of Struggle in High-Technology Capitalism*, University of Illinois Press

Jameson, Fredric 1976/2004, *Introduction to Critique of Dialectical Reason 1*, Jean-Paul Sartre, New York: Verso, pp. xiii - xxxiii

Kuhn, S. Thomas 2012 [1962], *The Structure of Scientific Revolutions*, Chicago & London: The University of Chicago Press

Lyotard, J-F. 1979, *The Postmodern Condition: A Report on Knowledge*, Manchester UK; Manchester University Press, pp. 3-6.

Manovich, Lev 2013, "Looking at One Million Images: How Visualization of Big Cultural Data Helps Us to Question Our Cultural Categories." Paper presented at the Digital Humanities 2013 conference, Hannover, 5-7 December 2013

Marx, Karl 1976, *Capital. A Critique of Political Economy. Volume 1*, New York: Penguin Books

Marx, Karl 1999 [1847], *The Poverty of Philosophy. Answer to the Philosophy of Poverty*, by M. Proudhon, Paris and Brussels: Progress Publishers, marxists.org

Pavelski, Joel 2013, "Medieval peasants got a lot more vacation time than you: economist", New York: New York *Post*, http://nypost.com/2013/09/04/medieval-peasants-got-a-lot-more-vacation-time-than-you-economist/

Varoufakis, Yanis, Joseph Halevi and Nicholas J. Theocarakis 2011, *Modern Political Economics. Making sense of the post-2008 world*, London: Rutledge

Žižek, Slavoj 2009, *First as Tragedy, Then as Farce*, New York & London: Verso

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Psychoanalysis, Science, and Worldviews

Ed Pluth

Abstract: This paper explores one aspect of the differences between Freud and Lacan on the relationship between psychoanalysis and science. Freud thought psychoanalysis did not need a worldview of its own: it had science's. I argue that Lacan disagrees with this. Lacan also does not want psychoanalysis to become a worldview, but he in fact thinks that there is a worldview particular to science that psychoanalysis can highlight, and should avoid. I explore his indebtedness to Koyré and Gueroult's work on Descartes for his claims, in *Science and Truth,* that science entails a suturing of the subject and for his claim, in his eleventh seminar, that science entails an avoidance of "the abyss of castration". Insofar as philosophy today is primarily naturalist, if not scientistic, I argue in conclusion that philosophers should consider Lacan's strategy for avoiding making psychoanalysis a worldview, which I characterize in terms of developing a discourse that takes a further step forward into the subject-position and world associated with science. It is an open question, however, whether philosophy could do this, and I think this is part of what makes the philosophy/anti-philosophy debate surrounding Lacan's work so important.

Keywords: Psychoanalysis, Science, Lacan, Freud, Descartes, Subject, Koyré

Lacan said in his eleventh seminar that psychoanalysis is not a *Weltanschauung*.[1] (He was echoing Freud's remarks from the "New Introductory Lectures" when he said this, whose closing chapter is devoted to, and entitled, "The Question of a *Weltanschauung*". Now, Freud did not exactly deny that psychoanalysis is a *Weltanschauung* there. His view was, rather, that it did not have one of its own. In Freud's view, psychoanalysis had no other *Weltanschauung* than science's:

> Psycho-analysis, in my opinion, is incapable of creating a *Weltanschauung* of its own. It does not need one; it is a part of science and can adhere to the scientific *Weltanschauung*.[2]

I will argue that there is much in this passage with which Lacan actually disagrees, and exploring his remark from seminar eleven in more detail will clarify this. Considering this issue will also lead to a better appreciation of how Lacan wanted to situate psychoanalysis vis à vis science, and why he did it the way he did it. I will discuss in my conclusion how philosophy could take a lesson from Lacan's move, if philosophy too wants to

1 Lacan 1978, p. 77

2 Freud 1964, p. 181

quit the business of developing worldviews.

My point would be easy to make if we could just substitute the word *discourse* for *Weltanschauung*. For it is certainly Lacan's view that psychoanalysis can create a discourse of its own, and he even thinks it needs to. He is nearly at this conclusion already in 1965 with the discussion in "Science and Truth" of the different status the truth as cause has in magic, religion, science...and, finally, psychoanalysis. The distinction between psychoanalysis and science is even more clear when the four discourses of the master, the university, the hysteric, and psychoanalysis are discussed in seminar seventeen (1969-1970) – provided we agree with Bruce Fink, who argues that "Lacan...identifies the discourse of science with that of hysteria."[3] Certainly by seminar twenty, that science and psychoanalysis are distinct discourses is even more obvious, and can no longer be denied: "the analytic thing will not be mathematical. That is why the discourse of analysis differs from the scientific discourse."[4]

Freud says psychoanalysis does not need a worldview of its own – it has science's. Lacan says psychoanalysis is not a worldview. It will be, or should be, a discourse. These are in fact two very different positions. Lacan does in fact agree with Freud about what a *Weltanschauung* is. But the central point on which he differs from Freud that I think has not been explored is not only about the nature of science (which I will get into only a little bit here, and is much-commented on) but on whether there is a worldview proper to science, and whether psychoanalysis aligns itself with this worldview or not. I want to say that Lacan seems to think there is one (Freud's views on this are not actually a bit complex, we'll see) and that psychoanalysis needs to avoid it – in an odd way, but one familiar to readers of Lacan: by plunging itself more deeply and thoroughly into it. Science can then even be associated with a worldview in the pejorative sense in which both he and Freud understand the term. I say this because Lacan associates science with an avoidance of "the abyss of castration" and a suturing of the subject. These are points about science that Lacan seems to think Freud did not see, and they are an important part of what leads him to develop a different path for psychoanalysis.

To be clear, I am not saying Lacan is taking a step backwards with respect to science, or even that he is engaging in a critique of the sciences. He is also not saying that the sciences should be ignored, or somehow need to be corrected by psychoanalysis. In fact, I take him to be arguing that psychoanalysis entails another step forward into the worldview associated with science, and especially, also, the subject position that accompanies it, which he thinks science neglects (and this will be the key point, we'll see). Yet, as I have already suggested, this is a step

3 Fink 1995, p. 133

4 Lacan 1998, p. 117

forward that is also some sort of step aside (and we should not and need not say 'out': the topology of such a step is obviously convoluted and, let's say, very Lacanian). It is just such a move, I think, that philosophy should take regarding science as well – again, if it wants to be serious about not developing worldviews.

First, some clarity on what is meant by a worldview. Psychoanalysis does not provide a worldview of its own, Freud wrote. It adheres to science's. But just what is science's worldview? This gets complicated. Freud himself finds it to be rather minimalistic and negative – in fact, it turns out that it might have been better to say that it is not really a worldview at all. For here is how Freud understands what a worldview is:

> By *Weltanschauung,* then, I mean an intellectual construction which gives a unified solution of all the problems of our existence in virtue of a comprehensive hypothesis, a construction, therefore, in which no question is left open and in which everything in which we are interested finds a place. It is easy to see that the possession of such a *Weltanschauung* is one of the ideal wishes of mankind. When one believes in such a thing, one feels secure in life, one knows what one ought to strive after, and how one ought to organize one's emotions and interests to the best purpose.[5]

Religions provide a *Weltanschauung*, as do philosophies, as do political movements (Freud discusses Marxism from this perspective in his chapter). But the sciences do nothing of the sort, Freud seems to think. At the end of the chapter, his conclusion is in fact that science

> scarcely deserves such a grandiloquent title [as that of a worldview – EP], for it is not all-comprehensive, it is too incomplete and makes no claim to being self-contained and to the construction of systems. Scientific thought is still very young among human beings; there are too many of the great problems which it has not yet been able to solve. A *Weltanschauung* erected upon science has, apart from its emphasis on the real external world, mainly negative traits, such as submission to the truth and rejection of illusions.[6]

We do get from Freud here a simple, and one could even say simplistic, answer about what the scientific worldview entails: an "emphasis on the real external world," a "rejection of illusions," and a "submission to the truth". And seemingly not much else. So, even though Freud does speak

5 Freud 1964, p. 158

6 Freud 1964, pp. 181-182

of it having a worldview, science's worldview is not really one, since it does not do what worldviews typically do: it is mainly negative and critical. It serves to correct the delusions worldviews construct. (To paraphrase Meister Eckhart's plea to God: if it is a worldview, it is one that asks us to rid ourselves of worldviews...)

Lacan agrees with Freud about psychoanalysis not being a *Weltanschauung* in the pejorative sense. But he does not agree with Freud's view that the way to avoid becoming one is to ally with science. Why?

According to Jean-Claude Milner the difference between Freud and Lacan on science can be thought of in the following way: Freud was a man committed to the ideal of science, his "scientism" was "nothing other than a consent to the ideal of science."[7] This is very clear in a text like "The Question of a *Weltanschauung*," in which Freud without hesitation positions psychoanalysis as a natural science, and does not even seem willing to acknowledge a distinction between the natural sciences and the social sciences. And for Freud, the more psychoanalysis is like a science the less like a worldview (the truer) it is. Lacan, however, "goes his own way on the question of the ideal of science: he does not believe in it. To be exact, he doesn't believe in it *for psychoanalysis*."[8] Instead, for Lacan, Milner argues, "psychoanalysis will find in itself the foundations of its principles and methods."[9] I would disagree with Milner here only slightly: Lacan thinks that the principles and methods of psychoanalysis will be founded not simply in psychoanalysis itself, but in the subject that the sciences have created.

This is how I want to think of the distinction between Freud and Lacan on science, then: the difference is not only about whether science is an ideal for psychoanalysis, or whether psychoanalysis *is* a science, or what a science that would include psychoanalysis within it might be – all questions that Lacan is indeed considering in the mid-1960s, and that have been widely discussed. Milner is right that Lacan ultimately does not buy into any of this for psychoanalysis (and Lacan's journey to that position is long, arduous, and well-documented). I propose that the difference is rather about whether there is a scientific worldview, and how psychoanalysis is positioned with respect to it. Freud doesn't seem to think that there really is one: or there is, but it does not function in the way a worldview typically functions. (Because it is true.) Lacan does think science comes with a worldview, one that even functions as a worldview typically does. For Lacan psychoanalysis will not be a worldview then not, following the Freudian argument, because it is a science, or because it adopts science's worldview, but instead because it is a discourse with its own

7 Milner 2000, p. 34

8 Milner 2000, p. 35

9 *Ibid.,* p. 36

specificity, one that approaches, or appreciates, science as a worldview. Without getting into further detail here about what it is to be a discourse, I want only to say that for Lacan an important feature of developing a discourse entails a further step into formalization and mathematization – and this is why I characterized Lacan's view of psychoanalysis earlier as a further step into, yet also aside from, the world and the subject of science. It is a radicalization of both.

But why am I saying that Lacan takes science to be a worldview? I will focus on just a few remarks he makes about science that indicate this, from seminar eleven and from *Science and Truth*.

In seminar eleven, after agreeing with Freud that psychoanalysis is not a *Weltanschauung* and that a *Weltanschauung* is essentially a delusional philosophy, Lacan shows us next how his view of the sciences is clearly different from Freud's. Recall that Lacan at the time was answering a question from Xavier Audouard regarding whether the analyst should let it be known to the analysand that he or she is being observed. Lacan denies that psychoanalysis is a worldview (how this constitutes an answer to that question, decide for yourself). And then he makes this point:

> To go from perception to science is a perspective that seems to be self-evident, in so far as the subject has no better testing ground for the apprehension of being. This way is the same one that Aristotle follows, taking as his starting-point the pre-Socratics. But it is a way that analytic experience must rectify, because it avoids the abyss of castration.[10]

When Freud denied that psychoanalysis had a worldview of its own, he shifted into a discussion of science and what it does, and praised its critical, negative spirit – to which he wished to affiliate psychoanalysis. Lacan denies that psychoanalysis is a worldview altogether, and then goes into the conditions of science's emergence. He contests a simple, vulgar empiricist account of its origins. Koyré did this: Freud, obviously, didn't. This is our first clue as to how important Koyré is for Lacan on this topic.

But then Lacan adds a puzzling remark about castration, which is why I am saying that he portrays science as something that entails a distinct worldview. And it could be that this point is also inspired by Koyré's work. The anti-empiricism point is easy to find in Koyré. Arguing for the superiority of Descartes's method over Bacon's (announced) new science in the *Novum Organum*, Koyré wrote that

10 Lacan 1978, p. 77

> Bacon's solution had an enormous success: but a purely literary one. Because this new science – active, empirical, and practical science – whose coming was announced by his books, was not one he had been able to bring about. And no one was able to bring it about after him. For the simple reason that it was impossible. Pure empiricism leads us nowhere: not even to experience. Because every experience supposes a theory that precedes it. Experience – a question posed to nature – implies the presence of a language in which the question is posed. Because it did not understand this and wanted to "follow the order of things and not the order of reasons" as Descartes said, the Baconian reform was a failure. It is because it did understand this and took the inverse direction that the Cartesian revolution, which freed reason instead of hampering it, was a success.[11]

This is a view that is more to Lacan's liking: science does not follow a simple route from perception to theory. It takes a detour through mathematics. But why does he bring up an avoidance of castration? As far as I can tell, Koyré says nothing of the sort, not explicitly. But a further consideration of Koyré's work on Descartes does shed some intriguing light on the subject. A short book by Koyré, *Entretiens sur Descartes* (1944), from which I have just quoted, seems to be very important for Lacan's thinking here. It may be one of the reasons why in 1946 Lacan wrote that a "return to Descartes" is needed; I think it also provides, along with Gueroult's work on Descartes (which I will briefly discuss in a moment) the background for why Lacan in 1965 identifies the Cartesian cogito with a "certain moment of the subject that I consider to be an essential correlate of science."[12] In other words, Koyré's work on Descartes may be critical for understanding not only Lacan's anti-empiricist take on the sciences, and his association of science with mathematicity, but also for his view that science is a worldview that plays the same (delusional, symptomal) role other worldviews play: specifically, it entails an avoidance of the abyss of castration.

Bernard Burgoyne has already argued for the importance of this book to Lacan, describing it even as a "manifesto for formalization, almost a manifesto for the matheme" – and we all know how important these topics are for the Lacan of this period.[13] We find in this book not only a succinct statement of Koyré's anti-empiricist view of the sciences, echoed in what Lacan is saying in seminar eleven – the anti-empiricist passage I quoted above. But we also find Koyré arguing, in effect, that

11 Koyré 1944, pp. 41-42

12 Lacan 2006, p. 727

13 Burgoyne 2003, p. 79

there is a distinct worldview attached to modern science. And it is perhaps not too far-fetched to consider what it entails, or its effects, in terms of castration:

> For ancient physics, which is based on what is immediately given to the senses, on our everyday perception of the colored and sonorous world, the world of common sense in which we live, which abstract reasonings never go beyond, and which everywhere remains necessarily connected to notions of quality and force, it [Descartes's method – EP] is in the process of substituting a physics of clear *ideas*, a mathematical physics that banishes any sensible givenness from the real world, that rids it of any "form," force, and quality, and that presents a new image (or an idea?) of the Universe; of a strictly and uniquely mechanical universe. This is an image much stranger and much less believable than everything that the philosophers had ever invented. Much stranger, and less plausible – yet certainly true.

As for the Cosmos, the Hellenic Cosmos, the Cosmos of Aristotle and the Middle Ages, this Cosmos already shaken by modern science, Copernicus, Galileo, and Kepler: Descartes destroys it entirely.

I don't know if people realize what this discovery, or more precisely these discoveries (because they form a network and all together make up what has been called: the *Cartesian Revolution*) mean for humanity's consciousness at the time. And perhaps, simply, for humanity.[14]

Koyré is emphasizing here not only the new worldview associated with science, but what we could call its subjective effects. And just a bit later, the effects are put more clearly in terms of lack:

> This World, this Cosmos, Descartes's physics destroys it completely.
> What does it put in its place? Honestly, almost nothing. Nothing but space and movement. An infinite space in which there is no longer either order, hierarchical structure, or beauty. A space full of nothing, where there are but movements: movements without rhyme or reason; movements without aims and purposes. Things no longer have a proper place: all places, in fact, are perfectly valid; and all things, moreover, are equal. Everything is just matter and movement. And the earth is no longer the center of the world. There is no center, there is no "world". The Universe is not ordered by man: it is not "ordered" at all.[15]

14 Koyré 1944, pp. 80-81

15 Koyré 1944, pp. 83-84

Were we to stop here, it would be possible to see an affinity between what Koyré is saying and Freud's view that science is not actually a worldview. An empty, inhuman world of mere things replaces the harmonious, deep, meaningful world of antiquity. Such a (modern, scientific) perspective on the world would likely not qualify as a worldview in Freud's sense, since it is hardly reassuring. It is true, it is critical, it shatters our illusions... and it is not capable of providing the psychological reassurances that Freud thinks worldviews provide.

So, again, why does Lacan associate science with an avoidance of the abyss of castration? Why doesn't he agree with Freud? Why doesn't he align himself with the ideal of science in the way Freud did?

Koyré does not finish his story with what I have just quoted, and in what follows I believe we can find part of the reason for why Lacan does link the sciences with castration avoidance and, later, in *Science and Truth*, a suturing of the subject. Burgoyne finds in Koyré's book, seen as a whole, a "'phallic structure' of loss and repossession."[16] The book starts with a section on the strength of skeptical doubts in Descartes's time, called "The Uncertain World". Think of this as something like the threat of castration, an awareness of its possibility. It moves on to describe what Descartes's method brings about in a section called "The Lost [*Disparu*] Cosmos" (this is the section I have quoted from). Think of this as the threat realized. But it ends with what can be described as a reclaiming of the phallus in a section that Koyré entitled "The Universe Re-found," in which the Cartesian solution to skeptical doubts is presented. This involves, famously, the grounding of knowledge in the self-evidence of the cogito, and the equal certainty of God's existence and benevolence: what Lacan refers to in *Science and Truth* as the cogito's "anchoring in being" and later its attachment to God as the guarantor of "eternal truths".[17]

It has been widely remarked that when Lacan describes the "subject of science" what he has in mind is not this more robust version of the cogito, anchored in being, but the radicalization, or minimalization, of a particular moment of its appearance. Martial Gueroult's work is often cited as a source for Lacan's reading, in which, as Russell Grigg observes, "the certainty of the 'I am' derives purely from the *act* of utterance," which means also that "it is a certainty that lasts no longer than the time of the utterance."[18] This is why Gueroult argued that the cogito was, at least at a certain moment of the *Meditations*, not an ontological substance but an epistemological one. The cogito,

> being what subsists when one abstracts from everything else, and being that without which everything else could not subsist, that which cannot be abstracted away from...is substance according to the epistemological definition of the term: that is to say, a simple nature, absolute, *primo per se*, concrete, and complete.

The order of reasons thus authorizes Descartes to draw, from the second meditation on, on the basis of the thinking ego affirmed as substance, all the consequences needed in order for science to work, on the condition that he sticks to the epistemological sense of the word substance, without infringing on the ontological sense, which can only be conferred upon it later by divine veracity.[19]

The idea that the cogito is first, and maybe foremost, an epistemological substance is intriguing. Grigg comments further that "the cogito might even be seen as the ultimate ironic victory of skepticism by reducing the subject to a repetition of the gesture of endlessly grounding its own certainty through a reiteration of, 'I am, I exist; I am, I exist'."[20]

That such a reduced, minimal cogito is what Lacan has in mind by the subject of science is also affirmed by Jean-Claude Milner, who finds in the cogito, and what he calls Lacan's "*radical Cartesianism*," a subjective parallel to the stripped-down, bare, featureless universe described by Koyré:

> physics eliminates every quality from existence, therefore a theory of the subject that wishes to respond to such a physics must also strip the subject of every quality. This subject, constituted following the characteristic determinations of science, is the subject of science... The qualitative markings of the empirical individual are not appropriate to the subject, whether they are somatic or psychic, nor are the qualitative properties of a soul. The subject is neither mortal nor immortal, neither pure nor impure, neither just nor unjust, neither sinner nor saint, neither damned nor saved. Even the properties that for a long time have been believed to constitute subjectivity as such are not appropriate: this subject has neither self, nor reflexivity, nor consciousness.
> Such is precisely the existent that the *cogito* causes to emerge, if at least the order of reasons is taken seriously. At the very instant when this subject is pronounced as certain it is disjoint, by hypothesis, from every quality...[21]

16 Burgoyne 2003, p. 79

17 Lacan 2006, p. 727, p. 735

18 Grigg 2008, p. 143

19 Gueroult 1953, p. 54

20 Grigg 2008, p. 143

21 Milner 2000, pp. 38-39

This is precisely how Lacan thinks of the subject of science: a subject that he already in the *Weltanschauung* remark from seminar eleven described as a subject that is led back to its "signifying dependence."[22] Lacan's revision of the cogito highlights its domination by signifiers, and its dependence on a signifying repetition: in "*I am thinking: 'therefore I am*,' with quotes around the second clause, it is legible that thought only grounds being by knotting itself in speech."[23] A subject without qualities, one that is knotted up in signifiers, one that consists only in a "signifying dependence": this is the subject of science, which is also the subject of psychoanalysis. That it is a de-substantialized subject will turn out to be an important point in a moment.

If this subject is an "essential correlate of science" – if it is a "modification that has occurred in our subject position, in the sense that it is inaugural therein and that science continues to strengthen...ever further" – then why does Lacan see what he later calls a suturing of this subject as also essential to science's practice, to and its success?[24] Why does he claim in *Science and Truth* that science "forgets the circuitous path by which it [science] came into being," and that "it forgets a dimension of truth that psychoanalysis seriously puts to work"?[25] This is one of the deeper obscurities in Lacan's *Science and Truth* – that this subject is an "antinomic correlate" of science "since science turns out to be defined by the deadlocked endeavor to suture" it.[26] Lacan later in *Science and Truth* writes of this as a foreclosure, and suggests that because of it science could be considered a "successful paranoia."[27]

Lacan makes these claims because he seems to think that science necessarily takes the ontologizing step that Descartes took, beyond the positing of the cogito as an epistemological substance only. In other words, the mistake is to go from pure logic or epistemology, to ontology. This would explain why Lacan spends so much time on anthropology and psychology in *Science and Truth*: two human sciences that are dealing with the subject in the wrong way, ones that have, as he puts it, relapsed into "incarnating the subject."[28] The problem is not that the sciences treat the (allegedly mental) subject as a (physical) thing, either of which would qualify as some sort of "incarnation" of the subject. Rather, the problem is that both approaches do not deal with the subject of signifiers at all,

22 Lacan 1978, p. 77

23 Lacan 2006, p. 734

24 Lacan 2006, p. 727, p. 726

25 *Ibid.,* p. 738

26 *Ibid.*, p. 731

27 *Ibid.*, p. 742

28 *Ibid.*, p. 729

which Lacan thinks requires either a logic or a topology – and *not* an ontology. Hence his hesitation, in seminar eleven, regarding ontology altogether, and his claim that the unconscious "does not lend itself to ontology"...Lacan even calls it *pre-ontological.*[29] Could it be as simple as this? Science, which studies beings, in some form or another, must exclude from its domain the subject of the unconscious, the subject of psychoanalysis, which is a non-being... And when it does deal with the subject, in the human sciences, it is doing so from an erroneous point of view, in the manner of a worldview that is getting the real wrong.

What does this mean for philosophy and science?
The way that Freud and Lacan think of philosophy – as providing a worldview in the pejorative sense – is not how most practicing philosophers would currently describe what they are doing. The prevailing view among philosophers is some variety of naturalism, if not scientism. Insofar as they are aligned with the sciences, philosophers do not think they are providing worldviews anymore, although there are some voices that emerge now and then saying that they should. Indeed, philosophers seem to be very Freudian on this point: philosophy is not in need of a worldview of its own, its worldview is science's, and insofar as that is the case philosophy too is engaged in the project of enlightenment, shattering illusions, etc. The question Lacan poses to us is whether it is sufficient to align with the sciences in order to avoid being, or developing, a worldview. His conclusion was that a further step into the world and the subject that both brought about the sciences, and that the sciences reinforce, was needed – a step that would be able to highlight the specific subject associated with the scientific worldview. Lacan's position is quite bold and radical. He's saying that psychoanalysis is a new thing under the sun. It is not sorcery, not a religion, and...not a science. But not a philosophy either. It is a discourse, in important respects parasitic upon the sciences, and for this reason it more successfully than any of its discursive predecessors manages to avoid being a worldview: provided it is careful about the distinctness of its position. Can philosophy avoid developing worldviews? To the extent that it is committed to sense, and being, can it ever stop doing so? Can a psychoanalytic (Lacanian) philosophy manage this? I think this is an open question, and it is one way of seeing what is so important about the philosophy/antiphilosophy debate surrounding Lacan's work.

29 Lacan 1978, p. 29

Bibbliography

Burgoyne, Bernard 2003. 'From the Letter to the Matheme'. In *The Cambridge Companion to Lacan*. Ed. Jean-Michel Rabaté.Cambridge: Cambridge U Press. Pp. 69-85.

Fink, Bruce 1995. *The Lacanian Subject: Between Language andJouissance*. Princeton: Princeton U Press.

Freud, Sigmund 1964. 'New Introductory Lectures on Psychoanalysis'. In *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, *Vol. XXII. (1932-1936)*. Trans. James Strachey. London: The Hogarth Press and the Institute of Psycho-Analysis. Pp. 3-182.

Gueroult, Martial 1953. *Descartes selon l'ordre des raisons. I. L'âme et Dieu*. Vienna: Aubier.

Grigg, Russell 2008. *Lacan, Language, and Philosophy*. Albany: SUNY Press.

Koyré, Alexandre 1944. *Entretiens sur Descartes*. New York: Brentano's.

Lacan, Jacques 1978. *The Four Fundamental Concepts of Psychoanalysis*. Trans. Alan Sheridan. New York: Norton.

--- 1998. *The Seminar of Jacques Lacan: Book XX. Encore. 1972-1973*. Ed. Jacques-Alain Miller. Trans. with notes by Bruce Fink. New York: Norton.

--- 2006. *Écrits: The First Complete Edition in English*. Trans. Bruce Fink in collaboration with Hélöise Fink and Russell Grigg. New York: Norton.

Milner, Jean-Claude 2000. 'The Doctrine of Science'. Trans. Oliver Feltham. *Umbr(a): A Journal of the Unconscious*. (No volume number): Pp. 33 63.

On Science and Philosophy

Hans-Jörg Rheinberger

Abstract: The paper is a plea for bringing together the history and philosophy of science in a unitary perspective. It starts from thoughts developed by the German philosopher Ernst Cassirer in his posthumous, last volume of the *Problem of Knowledge*, and it continues with outlining a comparable position of the French philosopher and historian of science Gaston Bachelard. The last section is devoted to the author's own view of a historical epistemology of experimentation.

Keywords: Bachelard, Cassirer, epistemology, experimentation, science, philosophy

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With this aperçu, I would like to sketch a few thoughts with respect to the relation between philosophy and contemporary science, philosophy of science and contemporary science more precisely, that do not have any systematic aspiration. They are, on the contrary, the conclusions of someone who started his academic career as a philosopher of science, then retooled as a natural scientist, more concretely as an experimental molecular biologist, aaznd ended up as a historian of science, or perhaps more to the point, a historical epistemologist. But in order not to completely leave these deliberations in the realm of the personal, I will embed them in a brief discussion of the respective thoughts of two philosophers of science who paved the way to historical epistemology around the middle of the twentieth century: one of them brought up in Germany, the other in France. I have attempted to determine their place in the broader trend of historicizing epistemology from the *fin de siècle* throughout the twentieth century elsewhere.[1] Both of them did not inform my early education. But both of them became firm reference points for my further intellectual development.

"The Era of the Great Constructive Programs Is Past and Gone"

Ernst Cassirer concludes his introduction to the fourth and last volume of *The Problem of Knowledge*, devoted to *Philosophy, Science, and History Since Hegel*, with the following words: "The era of the great constructive programs, in which philosophy might hope to systematize and organize all knowledge, is past and gone. But the demand for synthesis and synopsis, for survey and comprehensive view, continues as before, and only by this sort of systematic review can a true historical understanding of the indi-

1 Rheinberger 2010.

vidual developments of knowledge be obtained."[2] These sentences stand at the end of a lifelong occupation with the relation between science and philosophy. They imply two remarkable consequences. First, there was a time in the history of the development of the sciences in which such encomspassing philosophical programs were possible and even beneficial, according to Cassirer. He saw Kant as the culmination point of this era and, at the same time, as the messenger of its decline. It was the development of the sciences themselves that since then has made such an approach impossible. And second, what needs to come to replace them is "a true historical understanding of the individual developments of knowledge." Systematicity has to be replaced by historicity. Metaphysics has to give way to epistemology. Such is then the double task of what consequently can be called historical epistemology, the philosophy of science of our era: On the one hand, it has to conceive of itself as a historically changeable enterprise, an enterprise that is entangled with, and cannot be separated from, the dynamics of the sciences. And on the other hand, it has to develop a historical understanding of the diversification of scientific knowledge production.

Cassirer concluded that such a reorientation "requires a persistent, patient steeping of oneself in the work of the separate sciences, which must not only be investigated in respect to principles but explained concretely, that is, in the way they conceive and handle their primary and fundamental problems."[3] And this is what he himself did, during his years of exile in Gothenburg between 1935 and 1941, with this last, posthumously translated volume of his knowledge tetralogy, steeping into the problems of what he called the exact sciences (non-Euclidean geometries and theoretical physics), biology, and the historical sciences of the second half of the nineteenth and the first half of the twentieth century. In addition, he made clear that even in the loftiest heights of theory, what was of foremost importance was its empirical grounding, commenting with a quotation from Werner Heisenberg: "The modern theories have not originated from revolutionary ideas brought into the exact sciences from without, so to speak; rather they are naturally forced upon science as it attempts to carry out logically the program of classical physics ... It is manifest that experimental investigation is always the necessary pre-condition of theoretical knowledge, and that significant progress is made only under pressure from the results of experiment, never through speculation."[4]

In this book, Cassirer developed what he called a "functional" perspective on knowledge. For such a view, the object does not count as "a given fact but as a problem; it serves as the goal of knowledge, not as its starting point." And he continues: "No matter whether we are concerned with the ideal or the real, the mathematical or the empirical, with nonsensuous or sensuous objects, the first question is always not what they are in their absolute nature or essence, but by what medium they are conveyed to us; through what instrumentality of knowledge the knowing of them is made possible and achieved."[5]

What this means is that scientific practice in its diversification is coming to be seen as the driving force of the sciences, and that this not only conditions theories, but also the forms in which one can fruitfully reflect upon them. The turn to scientific practice that underlies such a deeply historically tainted epistemology is therefore crucial. In fact, it implies a turn of the attention from the corpus of knowledge to the scientific research process. Philosophically reflecting upon the sciences then becomes equivalent to reflecting upon how they produce their results and how they manage to permanently transgress their own actual boundaries at a given time.[6]

"Every Hypothesis, Every Problem, Every Experiment, Every Equation Would Demand Its Philosophy"

Gaston Bachelard, the ten years younger French contemporary of Cassirer, who is generally credited as being the father of historical epistemology *à la française*, developed his ideas about the contemporary sciences along similar lines. In the opening of his *Philosophy of No*, we read the following sentences: "Every hypothesis, every problem, every experiment, every equation would demand its philosophy. A philosophy of epistemological detail needs to be founded, a differential, scientific philosophy which would constitute a counterpart to the integral philosophy of philosophers. This differential philosophy would be responsible for measuring the development of a thought."[7] What Bachelard calls a differential, or "distributed" philosophy departs from the premise that "the mind at

2 Cassirer 1950, p. 19.

3 Cassirer 1950, p. 18.

4 Cassirer 1950, p. 83, quoting Heisenberg 1935, pp. 5-26, on pp. 7 & 16sq.

5 Cassirer 1950, p. 62.

6 See Rheinberger 2012, pp. 105-111.

7 Bachelard 1968, p. 12. Translation amended.

work is a factor of evolution."[8] Scientific rationality is not something given *a priori*, but a product of the scientific activity itself and thus deeply marked with a historical index. A philosophy that seeks to do justice to the sciences must itself be and remain a philosophy at work, a "tentative philosophy of science."[9] The dynamics of scientific development calls for a kind of philosophical reflection that is able to emulate its transgressive character. The coherence of such a reflection can no longer be a systematic one, where everything revolves around a center. It can only be a genealogical coherence, a coherence of historical diversification. In his *Le Rationalisme appliqué*, Bachelard finds the following words for this movement: "One cannot achieve such a deep-going renewal without a disposability of the scientific spirit, a disposability that is in need of a more or less explicit poly-philosophism."[10] The "coherent pluralism"[11] of the sciences is in need of a coherently pluralistic philosophy. And Bachelard continues: "The history of the sciences abounds in events of reason, facts that have forced the rational organization of experience to reorganize itself."[12] *Events of reason* is the catchword here. An event is an event only if it cannot be anticipated, if it cannot be deduced from first principles. To conceive the development of the sciences not as a deployment of an originary reason, but as a series of events that can touch on the character of reason itself, is thus a profoundly discontinuous, yet recursively coherent process in need of a philosophy of science that shows the same character of openness, ready to risk its own presuppositions at any time if required.

It is clear that we have here an asymmetric relation. "Science in effect creates philosophy,"[13] as Bachelard put it in his *New Scientific Spirit*. Philosophical reflection on the sciences is kindled by the moves that scientific reason undergoes in its development. According to Bachelard, it is science as a materially mediated and collectively organized process of transgressing the boundaries of a given state of knowledge (the process of research) that poses the biggest challenge to philosophical reasoning. It is therefore a key for understanding the human forms of knowledge more generally. As Marx once put it: "In the anatomy of man there is a

8 Bachelard 1968, p. 14.

9 Pravica 2015.

10 Bachelard 1949, p. 43.

11 Bachelard 1932.

12 Bachelard 1949, p. 44.

13 Bachelard 1984, p. 3.

key to the anatomy of the ape."[14] It is only by taking up this challenge that philosophical reasoning can live up to its calling: to understand the human mind. The human mind is a mind that can risk itself.

"If, in any experiment, one does not risk one's reason ..."

In his short paper on "Surrationalism" Bachelard states accordingly: "There should be no hesitation: one should choose the side where one thinks the most, where one experiments the most artificially, where ideas are the least viscous, where reason loves to be in danger. *If, in any experiment, one does not risk one's reason, that experiment is not worthwhile attempting*."[15] This quotation gives me the keyword for a few remarks in conclusion. Experimentation is the form that the modern sciences have developed in order both to allow for and to contain the risk of reason. A historical epistemology that aims at doing justice to the dynamics of the modern sciences must therefore have a close look at the practices of experimentation.

However, experimentation is not the only legitimate object in an analysis of scientific practice. Scientific practice comes in many different guises that have aptly been described as "ways of knowing."[16] In the last instance, however, it is experimentation that has the power for, and is the driving force of, reorienting the research process. Consequently, my own work as a philosopher and historian of science has concentrated on an analysis of contemporary experimentation. In *Toward a History of Epistemic Things*, I have developed the notions of "experimental system" and "epistemic thing" in an effort to create an alternative to the traditional vision of experimentation as *ancilla theoriae*.[17] Epistemic things take shape in systems of experimentation composed of instruments, apparatus and procedures that stabilize them sufficiently but at the same time allow them to play out their ambiguity. At the core of science as a process, of science in the making, there is ambiguity. It is ambiguity that incites science to get away from the actual state of the art toward an open future. "Without ambiguity, no change, ever," as Paul Feyerabend put it aptly in his autobiography.[18] Determining the particular shapes in which the sci-

14 Marx 1953, p. 26.

15 Bachelard 1936, pp. 186-189, here p. 186.

16 Pickstone 2000.

17 Rheinberger 1997.

18 Feyerabend 1995, p. 179.

entific enterprise plays this game is a worthy focus of any philosophical and historical effort to learn about our human faculties of knowing.

Postscriptum

Almost forty years ago, I was invited to participate in a survey on "Why Philosophy, or What For?" published in the German annual publication *Dialektik*.[19] I add it here in a translation as a postscript; it appears to me that it still has not lost its actuality.

"The natural sciences are and continue to be about empirically investigating forms of movement and evolution of matter and conceptualizing them analytically. From a certain stage of their development, the empirical sciences realize a self-regulatory dynamic of experiment and theory formation, in the sense of an open system for which, as is generally known, the so-called 'boundary conditions' are constitutive in respect to its maintenance as well as its development. I would like to claim that philosophy is a moment of these boundary conditions, therefore co-constitutive for the maintenance and development of the sciences. It has, however, as a knowledge form *sui generis*, no place at the level of the empirical acquisition of scientific knowledge and its conceptualization. It leads into blind alleys if philosophical categories are substituted for scientific concepts. I would therefore also answer in the negative the question whether in the research process of the empirical sciences problems are being set free that need the means of philosophy for their solution. What, then, could co-constitutivity of philosophy for the sciences possibly mean? In philosophical thinking – it is perhaps better to speak of philosophical thinking instead of *the* philosophy – scientific knowledge and explanation of the world is being digested. This digestion confronts the sciences with different interpretations of scientific knowledge and explanations of the world: as positivistic, critical-rationalist, or materialist philosophies of science. And these interpretations clearly belong to the theoretical 'boundary conditions' of the maintenance and development of the sciences. On the part of the sciences, they are usually represented as spontaneous philosophy of the scientists. A form of philosophical thinking that presents itself as *accessible* to such spontaneous philosophy could, in a reversal of the question denied above, set free, in the research process of the empirical sciences, *new* problems of a sort that require the *means of the sciences* in their solution."

19 Rheinberger (1980), „Orientierungen der Philosophie," pp. 147-171, on pp. 164-165.

Bibliography

Gaston Bachelard, Le Pluralisme cohérent de la chimie moderne. Librairie Vrin, Paris 1932.

Gaston Bachelard, Surrationalism. Translated by Julien Levy. In: Julien Levy (ed.), Surrealism. Black Sun Press, New York 1936

Gaston Bachelard, Le Rationalisme appliqué. Presses Universitaires de France, Paris 1949, p. 43.

Gaston Bachelard, The Philosophy of No: A philosophy of the New Scientific Mind (1940). Orion Press, New York 1968, p. 12. Translation amended.

Gaston Bachelard, The New Scientific Spirit (1934). Translated by Arthur Goldhammer. Beacon Press, Boston 1984, p. 3.

Ernst Cassirer, The Problem of Knowledge. Philosophy, Science, and History Since Hegel. Translated by William H. Woglom and Charles W. Hendel. Yale University Press, New Haven and London 1950

Paul Feyerabend. Killing Time. Autobiography. Chicago University Press, Chicago and London 1995

Werner Heisenberg, Wandlungen der Grundlagen der exakten Naturwissenschaft in jüngster Zeit, in: Wandlungen in den Grundlagen der Naturwissenschaft. Zwei Vorträge. Leipzig 1935

Karl Marx, Grundrisse der Kritik der politischen Ökonomie. Rohentwurf 1857-1858. Dietz Verlag, Berlin 1953

John V. Pickstone, Ways of Knowing. A New History of Science, Technology and Medicine. Chicago University Press, Chicago 2000

Sandra Pravica. Bachelards tentative Wissenschaftsphilosophie. Passagen Verlag, Wien 2015.

Hans-Jörg Rheinberger, Warum und wie existiert die Philosophie in ihrem Verhältnis zu den Wissenschaften? In: Warum oder wozu Philosophie? Antworten auf eine Umfrage zur Bestandsaufnahme. Dialektik. Beiträge zu Philosophie und Wissenschaften 1 (1980)

Hans-Jörg Rheinberger, Toward a History of Epistemic Things. Synthesizing Proteins in the Test Tube. Stanford University Press, Stanford 1997

Hans-Jörg Rheinberger, On Historicizing Epistemology. Stanford University Press, Stanford 2010.

Hans-Jörg Rheinberger, A Plea for a Historical Epistemology of Research. Journal of General Philosophy of Science 42 (2012), 105-111

For Theoreticism: Theoretical Practice and Philosophical Unconscious

Natalia Romé

Abstract: The article explores two theses. The first one proposes to revise the purported "theoreticism" of Louis Althusser in order to highlight that his developments on the problem of knowledge and the connection between science and philosophy are not only a necessary step in the pursuit of Marxist theory and its critic of idealist epistemology, but an indispensable condition to enable political thought itself. The second thesis considers the consequences of the processual and strategic Althusserian thinking for materialist philosophy, articulated around the category of overdetermination; a symptomatic reading of a topic and a position taken on a controversial field

Keywords: Marxist Theory, Althusser, overdetermination, philosophy, science, theoreticism,

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I. Introduction

In 1967, in the context of the growing popularity achieved through the publication of those works which doubtlessly would turn out to be his most celebrated ones, Louis Althusser undertook a process of severe self-criticism and correction of some of the thesis he had presented.

> *If I did lay stress on the vital necessity of theory for revolutionary practice, and therefore denounced all forms of empiricism, I did not discuss the problem of the 'union of theory and practice' which has played such a major role in the Marxist-Leninist tradition. No doubt I did speak of the union of theory and practice within 'theoretical practice', but I did not enter into the question of the union of theory and practice within political practice. Let us be precise; I did not examine the general form of historical existence of this union: the 'fusion' of Marxist theory and the workers' movement. (...)*
> *I did not show what it is, as distinct from science that constitutes philosophy proper: the organic relation between every philosophy, as a theoretical discipline and even within its theoretical forms of existence and exigencies, and politics. I did not point out the nature of this relation, which, in Marxist philosophy, has nothing to do with a pragmatic relation. So I did not show clearly enough what in this respect distinguishes Marxist philosophy from earlier philosophies.*[1]

1 Althusser 2005, p.15

The self-inflicted accusation had a philosophical sense that few of his readers managed to notice and, far from an intentional effect, it worked as a functional argument, which fed back in his posterity, both the incomprehension of his detractors as well as that of many of his disciples and followers.[2] In most cases, promoting allegedly critical readings of his thesis that remained captive by the dominant interpretative tendencies, which, in the name of politicizing theory, would broaden the channel of a general displacement towards forms of theoreticism, empiricism and, in its worst manifestations, plainly relativist positions (not only in their conception of knowledge but also in their political analysis). The last decades of the twentieth century would sanction their paradoxical posterity.

Time has gone by and the captivating power of the accusation of theoreticism has lost some of its efficacy. It is fair to admit that it is not due to the innocent passage of time, but because many of the passions that fueled the controversies that vied for the exegetical key of Marxist theory in the sixties and the seventies have weakened to the extreme. Moreover, it is necessary to point out that the release of a significant amount of Althusser's unpublished writings, the circulation of lesser known articles[3] and the revitalization of a field of readings through the work of several thinkers that, in some sense, could be considered Althusserian or post-Althusserian,[4] opened up an opportunity to return to certain areas of his work with more resources and less prejudices.

Within this framework, I propose to revisit some of the classical developments of what could be considered the matrix of Althusserian theoreticism, intending to reconstruct its coherence, in order to demonstrate that it says much more than what has been attempted to read in them. I will develop two interrelated conjectures: 1. That the problem of the articulation of political practice and theoretical practice is already inscribed –and enacted– within the early development of

2 "The original althusserian endeavor –with politics in the background– attempted to rescue marxism by regenerating its theory; but this commitment brought –as Althusser himself acknowledges– a grievous absence: that of political practice (class struggle). In his self-critical effort, he attempted to reintegrate practice, but relating it –and besides not through a necessary and essential bond– to theory. But, in this case, theory is not a science or knowledge, but a philosophy or a theoretical detachment of ideology. Theory as the sphere of truth remains autonomous and self-sufficient. In spite of his own rectifications and achievements in his hard self-criticism, Althusser has not been able to overcome his theoreticist «deviation». (Sánchez Vázquez 1975, p. 99).

3 After Althusser's death, in 1990, the edition of his unpublished writings was carried out tenaciously by the IMEC, the publishing house Stock and through the effort of many researchers who persisted in compiling, translating and distributing a great amount of his writings.

4 I refer both to his more or less direct disciples, such as Étienne Balibar, Jacques Rancière, Alain Badiou, Michel Pêcheux, and Pierre Macherey, as well as those who have critically recovered some of his problems or categories, such as Michel Foucault, Jacques Derrida, Slavoj Žižek, Ernesto Laclau, Judith Butler, etc.

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the category of *overdetermination*, with which Althusser pursues the materialist figure of Marxist dialectics, even in its most "theoreticist" formula: the definition of philosophy as the *Theory of theoretical practice.* 2. That, beyond the cartography Althusser himself traced of his writings, the critical access to the epistemological field, in order to give theoretical shape to Marxist philosophy in relation to the question of science, is required by the proper political determinations of his intervention. Althusser's critique of classical epistemology is directed towards the conceptualization of political practice as a specific practice and political thought as a singular kind of thinking. This question is already posed (in a practical state) in the category of overdetermination, which requires the theoretical distinction between different practices in order to enable the conceptualization of its concrete articulation in a conjuncture.

In short, the revision of the so-called "theoreticism", I propose, aims to emphasize the magnitude of the Althusserian contribution to the development of a critical conception of science and knowledge, remarkable in itself, but also crucial as an opportunity for a *political thinking* in its full right. I will not focus on his recently published correspondence, nor on his unpublished manuscripts or posthumous publications, which would offer a kind of shortcut to read the canonical writings in hindsight, once the problem of the junction of theory and practice has been posed explicitly.[5] I will focus, instead, on the classical texts, in order to read what was already there.

II. Overdetermination: topic and process

The notion of overdetermination is recovered by Althusser from Freud, who develops it within his study on the interpretation of dreams, in order to describe the type of operation proper to the unconscious thought: "Each of the elements of the dream's content turns out to have been 'overdetermined'-- to have been represented in the dream-thoughts many times over."[6]

From the Freudian approach to this notion, we are interested in highlighting some features which, as we understand them, survive in the Althusserian employment of the term, and in different ways, will compromise vast regions of his problematic. Firstly, unconscious thinking is a decentered process that produces *formations*. Secondly, its structure

5 Doubtlessly, in this sense, the Althusserian reading of Machiavelli can contribute to such an undertaking.

6 Freud 2010, p.301

is characterized by a certain disproportion or *disadjustment.*[7] Thirdly, the figure of disadjustment that the notion of overdetermination supposes is drawn in opposition to the notion of direct transparent representation and presupposes an omission; but omission and disadjustment do not operate on a lack but due to an *excess.*[8]

The Freudian notion of overdetermination takes the shape of a concept in Althusserian thinking in relation to the search for a kind of apodicticity adequate to the materialist position (which acts in the Marxist theory of history) and consequently responds to the problem of the conditions of intelligibility of a social formation. It is necessary to question –says Althusser– about: "...what is the content, the *raison d'etre* of the overdetermination of Marxist contradiction, and how can the Marxist conception of society be reflected in this overdetermination. This is a crucial question."[9]

In this deep rationality that inhabits psychoanalytic theory, Althusser pursues a solution to the problem of the relationship between structural legality and singularity (which is vital to the materialist theory of history),[10] understanding that the theoretical development of Marxism requires an accurate conceptualization of the singular legality that responds to this *processual topic.*[11] His texts are seeded with invocations to those aspects of the psychoanalytic problematic that correlatively call for a decentered topology and a complex temporality, neither homogeneous nor contemporary. Thus, it is convenient to clearly establish, in principle, that the appeal to the freudian notion does not operate as a kind of culturalist (or paralinguistic) reformulation of Marxism, but assumes the extremely complex philosophical problem of *reading,* which is another way to pose the "problem of knowledge"

7 "...condensation is brought about by omission: that is, that the dream is not a faithful translation or a point-for-point projection of the dream-thoughts, but a highly incomplete and fragmentary version of them." Freud 2010, p. 299

8 "Unconscious thought constitutes a "factory of thoughts" that produces 'nodal points' upon which a great number of the dream-thoughts converged, and because they had several meanings..." Id.:,p.291

9 Althusser 2005, p. 107

10 "If it is true, as Leninist practice and reflection prove, that the revolutionary situation in Russia was precisely a result of the intense overdetermination of the basic class contradiction, we should perhaps ask what is exceptional about this 'exceptional situation', and whether, like all exceptions, this one does not clarify its rule - is not, unbeknown to the rule, the rule itself. For, after all, are we not always in exceptional situations?" Althusser 2005, p. 104

11 Translator's note: "Topic" is used in this article in the sense of a "topographic representation of the psychic apparatus", following its psychoanalytic and later Althusserian use, rather than its more colloquial meaning.

within the framework of a theory of history.[12] Against this problem of the "religious myth of reading" an "open book", Althusser proposes another conception of reading which, honoring the psychoanalytic genealogy, he calls *symptomal*, but has precedents in the history of philosophy far beyond Freud. In that sense, Althusser highlights:

> *The first man ever to have posed the problem of reading, and in consequence, of* writing*, was Spinoza, and he was also the first man in the world to have proposed both a theory of history and a philosophy of the opacity of the immediate. With him, for the first time ever, a man linked together in this way the essence of reading and the essence of history in a theory of the difference between the imaginary and the true. This explains to us why Marx could not possibly have become Marx except by founding a theory of history and a philosophy of the historical distinction between ideology and science, and why in the last analysis this foundation was consummated in the dissipation of the religious myth of* reading.[13]

This reading is not the reading of a manifest discourse, the pursuit of a *voice*, but a *reading of readings*, the pursuit of symptoms and disadjustments: it is the reading of a topic.[14] Because starting with Marxist theory, the text of history is not a text where a voice speaks (the *Logos*), it is instead the "inaudible and illegible notation of the effects of a structure of structures."[15] What the Marxist theory of history mobilizes is an internal differentiation of the concept of history, an increase of the complexity that turns useless the dyads that organize classic epistemological thought (subject-object, theory-praxis). And it does this to the extent that it forces to pose the problem of the historicity of theory itself, in order to turn thinkable that of its object and, therefore, requires the effort of reconsidering the notion of *time*.

As a result, it is clear that, if the problem that the category of overdetermination means to conceive is posed by Althusser in the

12 That is why the whole lineage of critique formulated by diverse generations of the *Cultural Studies* against this Althusserian problem is, from the beginning, poorly based, with the single exception of Stuart Hall, who offers a more complex reading. Cf. Hall 1985, pp.91-114.

13 Althusser 1970, p. 16

14 "Such is Marx's second reading: a reading which might well be called 'symptomatic' (symptomale), insofar as it divulges the undivulged event in the text it reads, and in the same movement relates it to a different text, present as a necessary absence in the first. (...) Marx's second reading presupposes the existence of two texts, and the measurement of the first against the second (...) the second text is articulated with the lapses in the first text." Althusser 1970, p. 28.

15 Althusser 1970, p. 17

language of the Marxist problem of determination, it is however not referred to a mere question of the (direct or indirect) relations or interdependence between regions of social life, but to the historical and philosophical problem of *forms* as *formations.*

> *...it is sufficient to retain from him what should be called the accumulation of effective determinations (deriving from the superstructures and from special national and international circumstances) on the determination in the last instance by the economic. It seems to me that this clarifies the expression overdetermined contradiction, which I have put forward (...). This overdetermination is inevitable and thinkable as soon as the real existence of the forms of the superstructure and of the national and international conjuncture has been recognized - an existence largely specific and autonomous, and therefore irreducible to a pure phenomenon.*[16]

The main question, as this fragment raises, the dialectic. And the formula Althusser pursues is that of an *impure dialectic*. Or, broadly, the question about the problematic articulation between conceptuality and history, related to the question about the complex structure of temporality. Overdetermination, considered as a concept, deals with a dilemma we will attempt to develop. This dilemma is that of a concept which, as a concept, is not the unification of multiplicity but the indication of its impossibility. Overdetermination is proposed by Althusser as a name for the impossible task of conceptualizing the limits of the concept, that is, *the relationships between itself and what is not itself.* This is a capital question in order to understand the complex kind of articulation established between philosophy and science.

Althusser arrived to this Freudian notion in the search of a formula of the Marxist dialectic capable of expressing the rationality that inhabits Marxist theoretical practices, those that enable the premises of *Capital.* This dialectic is not only conceived by Althusser in a completely different light than that of Hegel,[17] but it is defined by its difference. This search

16 Althusser 2005, p. 113

17 Thus, Althusser demonstrates the relationship between the concentric topic of consciousness which the *Phenomenology of Spirit* prescribes and the conception of history as a teleological process: "A circle of circles, consciousness has only one centre, which solely determines it; it would need circles with another centre than itself - decentered circles- for it to be affected at its centre by their effectivity, in short for its essence to be over-determined by them. But this is not the case. This truth emerges even more clearly from the Philosophy of History." According to which: "the simplicity of Hegelian contradiction is never more than a reflection of the simplicity of this internal principle of a people, that is, not its material reality but its most abstract ideology." Althusser 2005, p. 102-103.

leads to conceive the materialist condition of the Marxist contradiction in the terms of overdetermination.[18] However, to the extent that the consistency of this concept rests on the Leninist (and later Maoist) reading of a given historical formation and its structural relationships in the key of *conjuncture* (that is to say, as a question about the concrete conditions of *political practice*), it already opens the philosophical space for problems that overrun the question of knowledge and that advance toward other zones of thought.[19]

It is important to underline that Althusser searches for the materialist definition of dialectics in a *double* movement: in Marx's theoretical work and in the experience of concrete revolutionary struggle (as recovered from the thought of Lenin, Mao, etc.). It is the very articulation of these heterogeneous practices what sets the complex space for materialist thinking.

So, we are lead to consider that it is the conjunction with Marxists' *political* thinking what furnishes the materialist nature of Marxist theoretical apodicticity.

We can find, here, the clues to a singular articulation between *philosophy and history* that lays down the thick – but not always visible – threads of what I understand as the Althusserian problematic. Overdetermination aims to a question about the *theoretical thinking* that is answered (since 1962, the date the first version of "Contradiction and overdetermination" was published) in a detour through *political thinking*. It involves a philosophical position that requires an *open structure* for theory because it attributes history the constitutive and permanent condition of an *exception to the laws*. The category of overdetermination displays its particular condition of being an axis around which the most classical Althusserian developments on science are organized, and a point of ambiguity that allows to overflow its space, opening up its depths to new questions. This ambiguity stems from, on one side, the formulas to which Althusser arrives in his search for the materialist formulation of the *theoretical necessity*; but on the other, it is itself an answer that places the problem of *the political* in the same field of the question of knowledge, producing a continuous disadjustment.

18 "If the Marxist dialectic is 'in principle' the opposite of the Hegelian dialectic, if it is rational and not mystical-mystified-mystificatory, this radical distinction must be manifest in its essence, that is, in its characteristic determinations and structures. (...) these structural differences can be demonstrated, described, determined and thought". Ibid., p. 93-94.

19 "Lenin gave this metaphor above all a practical meaning. A chain is as strong as its weakest link. (...) So far there is no revelation here for readers of Machiavelli." Ibid, p.94

III. Which theoreticism? Philosophy as the *Theory of theoretical practice*

The notion of overdetermination, coming from another tradition, constitutes Althusser's first attempt to positively theorize the specific materialism that furnishes the *philosophical* position of Marxist theory. The field for the Althusserian problematic is the field of philosophy (and not social theory, nor historiography, nor cultural analysis).

> *It is the existence of Marxist philosophy 'in the practical state' in Capital that authorizes us to 'derive' the Marxist conception of philosophy from Capital. (...) This work is a real theoretical work: not merely a work of simple extraction, abstraction in the empiricist sense, but a work of elaboration, transformation and production, which requires considerable effort.*[20]

The *philosophical* reading of Marx is organized by Althusser, in his first systematic attempt, as the question about *philosophy conceived as Theory of theoretical practice* and, even if this already exhibits an *aporia* (theory-practice) and a torsion (Theory of theory), it supposes some limitations that Althusser would point out sooner rather than later.[21] However, it is the growth of the premises that take shape in this field, which is assumed as the challenge of thinking materialist philosophy in its relationship with history. This produces a permanent widening of the problematic field driven by the encounter and the tension between theory and politics.

Resorting to overdetermination to conceive the specificity of materialist dialectics constructs, in the same inaugural gesture, the direction of the philosophical process. From then on, the materialist position in philosophy involves always, from the Althusserian perspective, reflecting about its relationship to history, or better yet, its own place in history. The concept of overdetermination itself is committed from the start to a singular conception not only of history, but of *historicity* and of *time*.[22] Not only of them, but of the reach and the conditions of their *intelligibility*. And, in this sense, it unveils that the problem of historical complexity is itself the problem of the relationship

20 Althusser 1990, p. 59

21 One could even think, as Balibar seems to suggest (2004) that the history of Althusserian thought coincides with the movement of self-criticism. In that sense, in addition to the later prologue to the second edition of *Pour Marx* we have already mentioned, his *Éléments d'autocritique* (1972), *Lénine et la philosophie* (1968), *Marx dans ses limites* (1977), among many others could be mentioned, including, doubtlessly, his posthumously published last writings on aleatory materialism.

22 As the suggestive essay "Notes sur un théâtre matérialiste" reveals, originally published in 1962 and later included in Althusser 2005, pp. 129-151

between theory and non-theory which is subtended from the begining in the materialist question of theory, opening up its space towards a point of irreducible excess to itself: the political practice. Something has emerged in Badiou's recent writings, when translating the problem of overdetermination in its (internal) tension with economic determination in the terms of the relationship between objectivity and politics:

> *Overdetermination puts the possible on the agenda, whereas the economic place (objectivity) is that of well-ordered stability (...) Overdetermination is in truth the political space.*[23]

It is within this scheme that overdetermination points toward a space of *articulation and difference* between objectivity and the political, signalled by the red thread of what could be called the "Althusserian problematic". And enables to encompass the relationship (twisted by the torsion) that is established between two problematic dimensions that have been read separately: theoretical practices and political practices. Even more so, if a specifically Althusserian problematic can be spoken of (rather than a more generally Marxist or structuralist one), it is due to this perseverance in thinking jointly that which by definition may not be joined. Overdetermination is, in this sense, the equation of a process of thought featured by a *contradictory effort of unification-differentiation.*[24]

Only by assuming the problematic magnitude of this thought can the series of theoretical developments that present a first approach to philosophy be considered; starting with the question of theoretical practice, formulated within the framework of a program that may give shape to a theory of science immanent to the Marxist theory of history. This is a zone of the Althusserian production that coincides with the formulation of some problems related to the concept of *conjuncture.* As I have said, the philosophical question of *theory* finds there its inconsistent consistency and, therefore, its concept and that of its torsion. In this sense, I understand that it is possible to contour the place

23 Badiou 2005, p. 65. It may be suitable to open up a discussion about the total coincidence of overdetermination and politics that would lead us to establish some qualms with regards to thinking the key of a political ontology from an Althusserian perspective, in the sense that is proposed in the current framework of the so-called postfoundational thought.

24 This effort is, not fortuitously, what connects Althusser's philosophical intervention to Lacan's psychoanalytic stake, who, on another order of problems, seems to develop a similar process: "In the course of his teaching, he explored different ways *jouissance* is captured by the signifier. Starting with the phallus, also designated as the signifier of *jouissance*, Lacan inaugurates an extraordinary series of terms that replace one another (...) In fact, each of these terms may be considered a «loose piece», to use Jacques-Alain Miller's formulation, an element of the real which, through the operation of signification is elevated to the dignity of the signifier, acting as a signifier, in order to stitch together what does not remain together." Šumic 2011, p. 49. The translation is our own).

of this axis in the general space of the Althusserian problematic, in the terms of the pair *theoretical practice-conjuncture*, in order to pursue this deconstructive operation that makes the problem of the political to appear "from within" the problem of theory, *as its excess*. The movement of that process results, as Balibar points out, in the effect of a *non-null trace* that may only be noticed in the framework of a philosophical reading. This allows us, as Balibar has stated, grant Althusser's texts something more than is usually searched within them, the *non-null effect* of a path that annuls his own thesis.[25] In our understanding, the thickest stroke in this void strike that produces a "non-void effect" is noticed in the movement through which, at the core of this philosophical question of the theoretical, *a distance is placed* where the problem of the political appears. This absent-presence of the political is the mark of historicity on theory; and from then on it is possible to assume that the politicity of philosophy is the place for its commitment to the real, as Althusser would develop in the following years.

> *All that can be truly philosophical in this operation of a null drawing is its displacement, but that is relative to the history of the scientific practices and of the sciences. (...) Hence there is a history in philosophy rather than a history of philosophy: a history of the displacement of the indefinite repetition of a null trace whose effects are real.* [26]

The analytical deployment of the notion of overdetermination and of its theoretical consequences enables us to approach the problem of *conjuncture* – or of structure as conjuncture – that is organized around the question of theory in the key of the intelligibility of history. The theoretical zone that grants consistency to the interrogation of the materialist philosophical problematic is the key of its *scientificity*. Althusser's so-called "theoreticist deviation", far from constructing a pantheoreticism or an hypertrophied formalism, allows to point out the *limits* of theory and, consequently, opens up the road to the possibility of thinking a materialist philosophy in its full right; that means, one that attempts to make history thinkable without subsuming it to its own logic. We place the nerve of this movement in the concept of overdetermination which, by being proposed as a key to the intellection of a conjuncture, lays down the limits to the *intelligible* in the *conjunctural*.

History leaves its mark on theory in the shape of a rupture which

25 Balibar 2004, p. 57

26 Althusser 1971, p. 38

is, at the same time, an historical event and a movement within the theoretical: a folding of theory upon itself. The *rupture* that Althusser identifies in Marxist theory with regards to its own Hegelian genealogy is not only historical or only theoretical. It is, rather, the *distance*, the twisted space that opens up between the historical and the theoretical, where the paradox of a *unity in disjunction* is at work.[27] Only this way can the notion of rupture be kept – only vaguely because of the Bachelardian encumberment that Althusser would later berate himself for and which Balibar rigorously defines[28] – if any degree of precision needs to be established.

Marx's rupture with Hegel does not simply consist of a "cut", in the sense of a *demarcation* of theoretical formations with regards to its non-theoretical (ideological) predecessors; but rather, it is that and also the index of an *endless process* which turns the Althusserian position into a *(re)commencement* of the Marxist position: its reading, its transformation and its struggle for existence. Its life and its crisis.

The Althusserian enterprise to produce a materialist philosophy by searching for it in Marx's theoretical production describes the form of a displacement that results in an *aporia*: the immanent philosophy of Marxist theoretical practices is, as such, its *interior criterion*. But it is not immanent only to Marx's theory, it is immanent also to the political practices of the workers' movement, as it stands out in a barely superficial reading of the classical texts: "...So we shall start by considering practices in which the Marxist dialectic as such is in action: Marxist theoretical practice and Marxist political practice."[29] The *aporia* is, then, that philosophy can only be thought of in its internal condition to a determinate science, if it is assumed also as the reading of that which results exterior to itself, because it is immanent to non-scientific practices. We have then that *philosophy is internal to science and overflows it at the same time*. This is the materialist philosophical position that will be built –not as a discourse but as an acting philosophy– in the process of theoretical work that encompasses almost three decades of writing.

27 Althusser puts this figure forth to account for the complexity of the Marxist problematic: "This attitude may be paradoxical, but Marx insists on it in categorical terms as the absolute condition of possibility of his theory of history; it reveals the existence of two problems, distinct in their disjoint unity. There is a theoretical problem which must be posed and resolved in order to explain the mechanism by which history has produced as its result the contemporary capitalist mode of production. But at the same time there is another absolutely distinct problem which must be posed and resolved, in order to understand that this result is indeed a social mode of production, that this result is precisely a form of social existence and not just any form of existence", Althusser 1970, p. 65

28 Balibar 2004, pp.9-48

29 Althusser 2005, p. 173

If, as we said above, the Althusserian problematic consists of dealing with the *disjointed union* of the theoretical and the political, Althusser turns this aporetic solution into the materialist formula for the problem that Marx's "discovery" puts in tension: the impossible encounter of philosophy and history is reinscribed as a contradictory *union* between theory and politics.[30]

This underscores the need for a critique of the philosophical tradition that identifies knowledge with political action, and of the emphasis on the rupture of the Marxist operation with the humanist tendencies, which Althusser defines as the *Philosophies of Conscience* in a clear nod towards psychoanalysis and its counter-epistemological potency.

On this line, Althusser will hold that the Marxist problematic takes shape as an operation of rupture within the very field of that hegemonic cypher (the Subject) that identifies knowledge with history. This operates not only as a matrix of philosophical thought, but also of common sense. "All of modern Western philosophy [is] dominated by the 'problem of knowledge'", says Althusser, and then clarifies: dominated by the ideological solution, imposed and anticipated to the formulation of the right question; imposed by "practical, religious, ethical and political 'interests' foreign to the reality of the knowledge..."[31] The formulation of the materialist philosophy that takes consistency in this Marxist operation of rupture is only possible on the basis of producing a non-humanist conception of the process of knowledge; that is to say, one that does not require the figure of the knowing Subject as a mirrored construction –at once *form* and *norm*– of the empirical knowing subjects. This critique of epistemology itself coincides with the practice of the new problematic of overdetermination, as the formula for the comprehension of a processual topic:

> *I will note in passing that the concept of process without a subject upholds the work of Freud. But speaking of a process without a subject implies that the notion of subject is ideologic. If this double thesis is taken seriously: 1. the concept of process is scientific; 2. the notion of subject is ideologic; two distinct consequences follow; 1. the revolution of the sciences, the science of history becomes formally possible, 2. a revolution in philosophy: since all of classical philosophy rests on the categories of subject + object (object = mirrored reflection of the subject). But this positive inheritance is still formal. The question posed is then: which are the conditions of the process of history? Marx owes nothing to Hegel there: he contributes on the decisive point something unprecedented: There is process only under relationships.*[32]

This means that, if science has itself a history, we need to accept that even if the "human individuals are its agents", knowledge may not be understood as the faculty of a subject, neither transcendental, nor empirical, nor psychological. Rather, thought develops as *a process under relationships*, this means, inscribed in the concrete framework of a historical complexity. The *processual* condition of knowledge is its *historical* condition. The ontological strength of this phrase may not be tamed in a few paragraphs. In order to comprehend it, a long *detour* I may not traverse is required here; but I may, nonetheless, extract some of its consequences. The first one is that the historical is part of the definition of the theoretical itself. Now, this strange "consequence" we extract from Althusser's intervention in the seminar dictated by Jean Hyppolite at the beginning of the seventies, and which can therefore be conceived of as part of an operation of "rectification", was already drafted in *Lire le Capital*, where Althusser does not refrain from insisting on the necessity of conceiving knowledge as a

> *(...) historically constituted system of an apparatus of thought, founded on and articulated to natural and social reality. It is defined by the system of real conditions which make it, if I dare use the phrase, a determinate mode of production of knowledges.*[33]

This system of theoretical production is articulated in a conjuncture: its practices are articulated with concrete economical, political and ideological practices; that is their *determined existence*. This is what defines and assigns functions to the thought of singular individuals "who can only 'think' the 'problems' already actually or potentially posed; hence it is also what sets to work their 'thought power'".[34] This way, it stops being conceived of within the scheme of a dichotomy that opposes a conscience to the material world without a remainder (and which therefore reflects it mirror-like). And, in exchange, it results in a "peculiar

30 A labor of research would be needed here, aimed at establishing the difference between the "union" employed by Althusser and the unity that could be derived from the hegelian idealist dialectic, in order to specify to which extent a *dialectic* can be still spoken of. That is not something we may develop here, but we cannot refrain from indicating the necessity of this task.

31 Althusser 1970, p. 53

32 Althusser in D'Hondt 1973, p. 119. My translation

33 Althusser 1970, p. 42

34 Ibídem

real system, established on and articulated to the real world of a given historical society"; a specific system of articulated practices, defined by the conditions of its existence, with a structure of its own.[35]

The specific feature of knowledge rests on its capacity to indicate its own place among the many other social practices,[36] and that it is therefore capable of indicating its own historical conditions, because it can also indicate the place and the historical conditions of the ideology it transforms and relegates to its own prehistory. That is, the perspective of a *process of production* of knowledge as a material production process, that is to say, starting from the conception of a "labour of transformation [*Verarbeitung*] of intuition [*Anschauung*] and the representation [*Vorstellung*] in concepts [in *Begriffe*]."[37] In this conception, the "raw material" of the institutions and representations is not thought of in the sense of a sensitive intuition or a pure representation, but consists *always-already* of complex articulations, which combine in turn "sensuous, technical and ideological elements".[38] There never is a pure object, identical to the real object, as the starting point in the process of knowledge. There is an *ideological* raw material that is transformed in the process of knowledge which produces, as a result, knowledges.

Thus considered, knowledge:

> *does not fall from the sky or from the 'human spirit'; it is the product of a process of theoretical labour, it is subject to a material history, and includes among its determinant conditions and elements non-theoretical practices (economic, political and ideological) and their results. But, once produced and constituted, the formal-theoretical objects can and must serve as the object of a theoretical labour in the strong sense, must be analysed, thought in their necessity, their internal relations, and developed in order to draw from them all the consequences - that is, all their wealth.*[39]

It is the concept of (overdetermined) *process* which indicates the historicity of the production of knowledge and therefore, also, its

35 Ibid.

36 As opposed to ideology, which erases its own conditions of production and offers itself with the strength of a tautological evidence, whose most accomplished form is still that of the discourse of the religious Subject "I am he who is"

37 Althusser 1970, p. 22. Recovering thus Marx's well-known expression in his *Zur Kritik der politischen Ökonomie*

38 Ibid., p. 43

39 Althusser 1990, p. 51

articulation with non-theoretical practices. If in the course of his self-criticism Althusser berates himself for not having fully contemplated the political dimension of the notion of rupture,[40] and derives from there a certain "deviation" that could result in a reading of the science/ideology demarcation in the idealistic key of error/falsehood, it is necessary to underline that its very definition as a theoretical *practice*, developed in "On materialist dialectics" contains already the crucial elements to avoid such confusion:

> *theory is a specific practice which acts on its own object and ends in its own product : a knowledge. (...) The knowledge of the process of this theoretical practice in its generality, that is, as the specified form or real difference of the practice, itself a specified form of the general process of transformation, of the ' development of things', constitutes a first theoretical elaboration of Theory, that is, of the materialist dialectic.* [41]

I hold that the concept of *theoretical practice*, which acts at the center of his conception of knowledge, forces us to consider the relationship (and demarcation) between *science* and *ideology* –in the framework of a philosophy of the *historical* distinction between scientific and ideological practices, correlative to a materialist theory of historical formations. This means, within the *overdetermined causality*. This is understood as the name of the condition at once specific to and differentiated from the general and theoretical practice or inscribed in the general process of transformation. What this enigmatic reference deploys is nothing but the emphasis on the strict practical condition of theoretical production and therefore points out the place where its specificity should be considered – that place is the thinking of an articulated complexity, or rather, of an overdetermined causality. This in turn allows us to think the difference and the articulation of theoretical practice with those that are not identical to itself: the ideological practices; but this way, it opens up the possibility (and the necessity) of thinking its difference and its articulation with other practices, economic, political...

It is therefore to the same extent that the inscription of the problem of knowledge is produced in the decentered topic of overdetermination (and this occurs at the same instant that theory is thought of as praxis) that the science/ideology difference *occupies* the site of the idealist truth/falsehood dyad and places, in its stead, a criterion that introduces the historical condition of *the concrete* and singular to the terrain of

40 As can be read on the prologue to the second edition of *Pour Marx* we already mentioned.

41 Althusser 2005, p. 173

Epistemology. Against what Althusser may suggest in his self-criticism, this critical movement is less indebted to the Bachelardian notion of epistemological rupture, than to the concept of theoretical *practice,* and to the materialist problematic as a thought of the differential articulation of practices.

It is the notion of overdetermination which produces the entry of history into philosophy, with regards to the "problem of knowledge". And it does so additionally with the virtue of not leading to any kind of relativism, to the extent that it is solidary with the premise according to which scientificity is con-formed as an *immanent system* of effective theoretical practices; this means, following a criterion of *radical interiority* of scientific practices, because the definition of theoretical practices in their specificity rests on the possibility of conceptualizing their *relative difference* with regards to other kinds of practices.

If Althusser berates himself for not having given an adequate theoretical form to this idea, that does not authorize us to suppose that it is not already practically in action in his classical texts. This way, reflecting on ideology, a new materialist philosophy is produced as a *displacement*, taking the stead of the "problem of knowledge", historically occupied (constituted) by modern philosophy:

> *since in this work of investigation and conceptualization we have to learn not to make use of this distinction in a way that restores the ideology of the philosophy of the Enlightenment, but on the contrary, to treat the ideology which constitutes the prehistory of a science, for example, as a real history with its own laws and as the real prehistory whose real confrontation with other technical practices and other ideological or scientific acquisitions was capable, in a specific theoretical conjuncture, of producing the arrival of a science, not as its goal, but as its surprise*[42]

And so much so that Althusser recalls Macherey's expression to hold that every science, in their relationship with ideology, can only be conceived as a "science of ideology"; assuming at the same time that "the object of knowledge, which can only exist in the form of ideology at the moment of constitution of the science"[43].

This issue is developed by Badiou under the idea that the pair science/ideology exists before each of its terms separately and this presupposes accepting that it is not a distributive opposition that could

42 Althusser 1970, p. 45

43 Althusser 1970, p. 46

allow to allocate the different practices and discourses, let alone to value them abstractly. Their difference may not be apprehended as a *simple contradiction* but as a *process*: science is a process of *transformation-differentiation* and ideology is a process of *repetition-unification*. Saying that science is "science of ideology" implies that "science produces the knowledge of an object of which a determinate region of ideology indicates the existence."[44] But, additionally, science is the science of ideology because, reciprocally, ideology is always ideology for a science: "The only discourses that are known as ideological are such in the retrospection of a science."[45]

We return like this to the idea of "rupture" and somehow begin to glimpse, in the form of its relationship to ideology, the topological character of the weave that makes up the Althusserian problem of knowledge (in its processual and complex condition). The topological figures announce the relationship between the "problem of knowledge" and the notions of *conjuncture* and *overdetermination.*

> *It is not exaggerated to say that DM is at its highest point in this problem: How to think the articulation of science onto that which it is not, all the while preserving the impure radicality of the difference? How to think the non-relation of that which is doubly related? From this point of view, we can define DM as the formal theory of breaks. Our problem thus takes place in a much vaster conceptual context, which concerns all forms of articulation and rupture between and among instances of a social formation.* [46]

It is not about thinking the process of knowledge under the philosophical guise of a theater conceived as the *closed* and *mirrored* relationship of the protagonists of the epistemic bond; but about thinking it in the topological key of a problematic understood as a *combination* or *articulation* of elements resulting from a (theoretical and non-theoretical) *conjuncture.*

The ideological weave of classic philosophy –says Althusser– may be identified in the figure of the circle of *guarantee*, because it is the question about the guarantee of knowledge that places us in the ideological terrain of the philosophy that goes from the "Cartesian circle" up to the circle of Hegelian or Husserlian teleology.[47] This circle

44 Badiou 1967

45 Ibid.

46 Badiou 1967: 20

47 Althusser, 1970, p. 53

explodes (and its explosion turns "visible") in the materialist premise that distinguishes, in order to never join again, the real object and the object of knowledge. Althusser finds in Marx that *other* relationship of knowledge, understood now as a relationship of *appropriation*. That is where science turns out to be a specific (different) form from the several human forms of appropriating the world, politics, morals, aesthetics and religion itself.[48]

Understanding the cognoscitive relationship as a form of *appropriation*, philosophy (as a "theory of practice") takes care of it, *but not only* of it; because in order to think about it, philosophy must be able to think about its difference; that is to say, its differential relationships to the other forms of appropriation that distinguish different practices. Every practice, as an activity of appropriation, presupposes two conditions; one is its processual and therefore incomplete, misconstrued character; the other, the always improper condition both of its object and of its result.

The "primacy of being over thought" may, in this framework, be translated in the sense of a *primacy of practices* (activity of conformation) with regards to the discourse of philosophy (having already become a form). A primacy which, therefore, is in no way a "foundation". In this framework, philosophy becomes:

> *a discipline* of this world*, as a discipline that has this world as an object in the effective forms of its apprehension (of "its appropriation" said Marx): forms of perception, of action, of social and political practice, of the theoretical practice of the sciences, of art, of religion, etc. That autonomy of philosophy is express to us through the rejection of any "positivism", any "empiricism", any "psychologism", any "pragmatism". Because if the "truth" is this content, this thing or this formula of science, if truth is this "given" or this "object", in its opacity or in its transparency in fact, we do not know what can be done with philosophy. It suffices with "studying reality" (...) philosophy will meet its natural death: it will be buried within existing sciences.*[49]

The Marxist notion of appropriation sets the problem of knowledge in the real terrain of practices *in* history and, consequently, also contaminates the philosophy that takes care of this problem with history. This is the

48 Althusser 2008, p. 55. The original edition of this texts corresponds to the article published by Althusser *Revue de l´enseignement philosophique* XIII, 5 (June-July 1963) as a response to an enquiry published by the journal regarding the relationship between philosophy and human sciences.

49 Althusser 1960: 28. My translation

sense in which a certain ambiguity or interchangeability that operates in the texts of the seventies should be understood, where the *theory of theoretical practice* is also "theory of practice in general – the materialist dialectic."[50] It is not a mere rhetorical displacement, but a deep idea: a Theory of theoretical practice is already in itself a philosophy of the complex articulation of differentiated practices, a theory of a "social practice" that does not exist other than as a complexity of practices, that means, as an inconsistent generality:

> *Thus, 'social practice', the complex unity of the practices existing in a determinate society, contains a large number of distinct practices. (...) is taken seriously even more rarely: but this prior condition is indispensable to an understanding of what theory itself, and its relation to 'social practice' are for Marxism.*[51]

As Badiou deducted earlier, the "systematic organization" of the elemental notions of *historical materialism* through *dialectic materialism* produces the general concept of practice as an effect, understood as the process of transforming a given raw material. However:

> *To say that the concept of practice is the most general concept of DM (its first regulated combination of notions) amounts to saying that in the "social whole" there exist only practices. (...) This also means that the generality of this concept does not belong to HM, but only to DM. The practice does not exist: "there is no practice in general, but only distinct practices."* [52]

History, as it is thought by historical materialism, only admits *concrete, determined, multiple practices*. It would seem that the radicality and potency of this thesis, which enable to place both ideological and theoretical practices (but also political practices) on the same terrain, have been insufficiently considered. And nevertheless, it is an altogether disruptive movement with regards to the traditionally described interplay of the pair *history* and *philosophy.*

Within this framework, Althusser's affirmation that "knowledge is concerned with the real world through its specific mode of appropriation

50 Althusser 2005, p. 169

51 Althusser 2005, p. 167

52 Badiou 1967: 35

of the real world"[53] should be considered. The question of knowledge will then be the question of the structure of that specific (and determined) mode of appropriation/transformation, in which the *theoretical practices* consist in their difference (and therefore in their relationship) with regards to other practices.

This does not constitute a problem exclusive to the history of science, but engages philosophy itself, not only the region called "Philosophy of Science" but all of Philosophy (this means, a certain philosophical formation, of course not any, but the one that claims the name of *the* Philosophy) that develops from the standpoint of the question of knowledge and constitutes its function as the operator of a cognoscitive guarantee.

The materialist position disregards the question of an *a priori* guarantee of knowledge, it dissolves the philosophical (ideological) figure of the "epistemic drama" and because of that, "staging the characters indispensable to this scenario (...) posing scientific consciousness the question of the conditions of possibility of its knowledge relation to its object"[54] loses its function. This confusion responds to the form in which philosophy has imagined the epistemic bond:

> *...a relation of interiority and contemporaneity between a mythical Subject and Object, required to take in charge, if need be by falsifying them, the real conditions, i.e., the real mechanism of the history of the production of knowledges, in order to subject them to religious, ethical and political ends (the preservation of the 'faith', of 'morality' or of 'freedom', i.e., social values).*[55]

Even if there still is a long road ahead before being able to speak about a fully materialist formulation of the problem of knowledge, the task of materialist philosophy with regards to this problem is indeed clear: to reflect on knowledge questioning its materials, without prefixing the answer with the "titles and rights" of other levels of social life (other concrete practices), morality, religion, etc. Such is the double struggle supposed by formulating the problem of knowledge in materialist terms; that is to say, in an immanent relationship to concrete and determined theoretical practices, where their specificity lies: without subordinating them to the religious requisite of reading; but, then, without subordinating

53 Althusser 1970: 54

54 Althusser 1970: 54

55 Althusser 1970: 55

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history to their purpose either.

The extent to which the intervention on the "squares" occupied by the Philosophy of Knowledge constitutes a *political* strategy to deploy the new bond between philosophy and history is remarkable. Surpassing this "turn of imagination" –which rests on the identification of *Logos* and History as the foundation of the "religious myth of reading"– demands placing the lens on the relationship proposed by Marx in terms of an "appropriation". This forbids resorting to the ideological solution which summons the characters Subject and Object in their *mirrored structure* of mutual recognition.

"Ideology is a process of redoubling, intrinsically (...) tied to the specular structure of fantasy (...). If science is a process of transformation, ideology —insofar as the unconscious comes to constitute itself therein— is a process of repetition."[56] There, it is resorting to the *practices* –as modes of differential appropriation– what allows to reformulate the relationship between *science* and *ideology* in the terms of a *process*.

And precisely because it is a process of transformation, the cognoscitive relationship of appropriation is not configured around any kind of operator of warranties; it does not consist of a movement of closure, it supposes a singular and specific *structure*: a paradoxical *structure of aperture:*

> *...the paradox of the theoretical field is that it is an infinite because definite space, i.e., it has no limits, no external frontiers separating it from nothing, precisely because it is defined and limited within itself, carrying in itself the finitude of its definition, which, by excluding what it is not, makes it what it is. Its definition (a scientific operation par excellence), then, is what makes it both infinite in its kind, and marked inside itself, in all its determinations, by what is excluded from it in it by its very definition.*[57]

This paradoxical condition of a space at once open and differentiated rests on what Althusser calls the "criterion of radical interiority" of knowledge in scientific practices. The structure of the theoretical field responds to the *paradoxical form* that supposes the coexistence of two premises, the *interior* condition of its definition and its *openness,* its lack of limits. In the aspects related to the problem of knowledge, the "criterion of radical interiority of the practices"

56 Badiou 1967

57 Althusser 1970, p. 27

establishes that *scientificity* is immanent to the theoretical practices, instead of constructing an *a priori* rationality or a prescriptive formula. But this is not all. The singularity of *immanent causality*, such as it is developed in the Althusserian problematic, is placed on the bond between the rationality of a formation and its *limits*; in that difficult to locate space where a *productive* mechanism is not merely *re-productive*.

That is the relationship between a formation and its limits because, in the case of theory, the "criterion of interiority" may not be uncoupled from the *open* condition of every science. As Étienne Balibar points out:

> *Althusser, on his part, never stopped holding that the "criterion of practice" for knowledge is internal to the theoretical practice of every science. Under the condition of remembering that, by definition, science is not a circle of closed ideas, but a practice open to other practices and to its own development.*[58]

Althusser proposes his notions of theoretical problematic and symptomal reading in the framework of a rejection of the philosophical thesis which, by identifying truth with discourse, formulates the problem of knowledge as a problem about its guarantee, in a circular scheme tied to the specular structure of fantasy.[59]

The symptomal reading is based on the consideration of a theoretical discourse that stems from "everything in it that 'sounds hollow' to an attentive ear, despite its fullness."[60] That is to say that reading, in order to be symptomal, must concentrate its attention on those zones where some imaginary formulas unavoidably weave into the theoretical texture, procuring to invest the spaces of *impasse.* And this is because it is there, in those extremely fragile spaces, where a science lives: a theory "depends less for its life on what it knows than on what it does not know."[61] It is those spaces alluded by the presence of ideological elements which indicate the *limits* of the theoretical discourse and constitute, for that same reason, its more vital points. That is why Althusser underlined the *paradoxical* movement he proposes as the matrix of theory: science is the science of ideology.

On other occasions, Althusser alluded to this thesis by evoking the spinozian expression according to which:

58 Balibar, 2004: 15 footnote 8. My translation

59 Badiou 1967

60 Althusser 1970, p. 30

61 Ibid.

> *It is just because (enim) we possess (habemus) a true idea that... that we can also say: "Verum index sui et falsi"; what is true is the sign both of itself and of what is false, and the recognition of error (and of partial truths) depends on starting from what is true.*[62]

Truth is always uncovered in a process of secondary order, it is a retroactive reading of what was already there. But it may not be said that reading is itself what locates truth, each and every time it has the theoretical discourse she reads as a condition. Philosophical reading draws itself therefore as a transition between the gesture that reads and uncovers that what was already there without being uncovered. It is a *process without Subject, Origin or End* where truth is not an attribute to be found, but the effect of a disadjustment.

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IV. Unconscious *sive* politics: words to (re)commence

The action of demarcation, profoundly bound to the problem of *reading* – and therefore of knowledge –, places philosophy in a *liminal* space. The question we may ask, from then on, is whether a formula capable of defining *diagonal-philosophy* in the field of the materialist premise of *immanence*, which the development of the problem of knowledge deploys under the condition of the *criterion of radical interiority of practices,* may be thought of. We return, finally and on another road, which is in its ultimate determination the same, to the problem of the *excess*. And with it, to the relationship between philosophy and topic.

The effort of Althusserian thinking to avoid closing the circle of complexity by attributing a supra-historical dimension to philosophy, even in the terms of a "practice" (mother-practice, practice of practices) is encountered repeatedly. On the contrary, with regards to the bond between philosophy and practices (always concrete, determined), Althusser insists on conceiving philosophical materiality as the *reading of a topic* that is an *intervention*. A sort of abstract theoretical knowledge that is nonetheless heterogeneous to itself, which operates as a political intervention every time it assumes its own internal politicity.

This is how Althusser would explain, early on in his well-known prologue to the second edition of *Pour Marx*, the *philosophical* condition of his texts: "they are philosophical essays, with theoretical investigations as their objects, and as their aim an intervention in the present theoretico-ideological conjuncture in reaction to its dangerous

62 Althusser 1976, 185: -186.

tendencies. (...) "They 'intervene' on two fronts, to trace, in Lenin's excellent expression, a 'line of demarcation' between Marxist theory on the one hand, and ideological tendencies."[63]

That double condition, of being both a philosophical text and an intervention would be translated years later into the paradoxical figure of the *eternity of philosophy*. "I will anticipate a tripe thesis: philosophy has no history = philosophy is "eternal" = nothing happens in philosophy."[64]

The "theory of the philosophy-effect" that consists of a repetition, of a nothingness which insists, and feeds back into an "eternal" causality, "in the sense in which Freud holds that the analytic unconscious is eternal",[65] summons a structural causality that supposes a "system of instances between which the philosophical unconscious figures."[66]

We arrive thus at the place of the (paradoxical) relationship between the *limit* and the *necessity* of overdetermination in the Althusserian problematic. This concept aims at an immanent, concrete and decentered rationality that assumes the paradoxical bond of logics to the singular. Paradoxical, because singularity is itself a category of logic, but it is also a category on the *limits of logic*, as Jacques-Alain Miller repeatedly insists.[67] In this sense, as a concept, that overdetermination is placed at the limits of the conceptual; or to put it more controversially, it is the limit-concept of the bond between the conceptual and the non-conceptual.

Thus, *overdetermination* is an attempt to answer –perhaps an answer that still has not found its question, or that has not managed to formulate it in adequate terms – the problem of the *necessity in history*, a necessity that does not only coexist but organizes itself *working as a limit*. It is not only about making history *thinkable*, but about taking on the commitment to think about the historically concrete and singular while situated in its midst (without thereby, as we have said, reducing it to a mere relativistic historization of thought). This sort of dialectic –if the term is still even fitting – is found in action – and more or less "visible" – in the structure of *aperture* acknowledged by Althusserian thought to a theoretical *Gliederung*. And it advances producing a trench, a profound contradiction within philosophical discursivity itself, from which there is however no escape: "It is not a matter of "suppressing philosophy"

63 Altussher 2005, p. 12

64 Althusser 1997, p. 333

65 Ibíd. 336

66 Ibíd 337

67 Miller 2007

(...) any more than the Freudian cure would consist of suppressing the unconscious."[68]

As a specific principle of the materialist dialectic, overdetermination takes shape in the question of the *necessity that operates as scientific rationality* and enables to account for the complex and decentered condition of the Marxist historical totality. In this sense, overdetermination is proposed as a principle of intelligibility, a cypher of *rationality*. And yet –and this is essential to the question– in its logical development, it resorts to the *detour* and to exceptionality in order to think the materialist commitment to necessity in *existence.* In other terms, in order to place the *singularity* of the concrete in history and the *real* and *processual* condition of its transformations, or the efficacy of political practice.

Conceptualizing overdetermination may be an impossible task or a paradoxical ambition, but it is precisely for that reason that we may affirm that it signals the *(re)beginning* of materialism in Althusserian philosophy.

Philosophy is in itself always a repetition (or better yet, an iteration): a game of positions without development toward any single place – but with real effects. The introduction of this all but new term is the position of a difference within the philosophical field, and that is why its beginning is always a (re)beginning. Because of that, it is also more convenient to speak of a "materialist position in philosophy" rather than a "materialist philosophy".

An overdetermined weave may be accessed at any point (from the theoretical perspective) but not at any point (from a political perspective). This dual disposition (theoretical and political) is not a duplicity of thought, it is rather the effort to hold a space between both problematic planes and to turn that space consistent as a "problematic" – as a disjointed union. It is therefore not capricious for Althusser to search for the operationality of the overdetermination principle in both fields –theoretical and political – simultaneously. On one side, the materialist dialectic is read as an immanent rationality of Marx's theoretical practices and as such, overdetermination is "torn away" from its practical performance, in Marx's scientific production. But that is not everything, the notion of overdetermination takes shape in Lenin's *political* strategy, in the thought of practical experience, in the field of its experience itself, which borders on the contemporaneity of the conjuncture.

This is what is irreplaceable in Lenin's texts: the analysis of the

68 "Il n'est pas question de «supprimer la philosophie» (...) pas plus qu'il n'est question, dans la cure freudienne, de supprimer l'inconscient". Althusser 1997, p. 340. My translation

> *structure of a* conjuncture*, the displacements and condensations of its contradictions and their paradoxical unity, all of which are the very existence of that 'current situation' which political action was to transform, in the strongest sense of the word, between February and October, 1917*.[69]

Irreplaceable, Lenin's thought is a *political thought*, a thought that develops in the matter of politics. It is not the thought of a *theoretician* "who necessarily reflects on necessity's *fait accompli*" but the thought of political action, "on the necessity to be achieved."[70]

Of course, it is not about finding Marx's "theory" in Lenin's "praxis"; nor about adding some theoretical practices to other political practices. It is about, on the contrary, thinking that a materialist problematic takes its consistency *between* theoretical practices and political practices and *between* scientific and political forms of thought: therein lies the singularity of the materialist position in philosophy that the Althusserian enterprise procures.

It would be excessive to hurry onto conjectures regarding the multiple factors that assisted to the brutal silencing and mocking of Althusserian thought. We cannot, however, refrain from remembering the disquieting suggestion Étienne Balibar launched on friends and foes alike, at the end of the eighties:

> *For almost twenty years, Althusser was, the controversial Marxist in France (...) Wiping out the role of Althusser in this period is a typical aspect of a more general censorship, which has a very precise meaning: it means denying that Marxism in the postwar period (especially in the 60's and 70's) was not a simple repetition of dogmas (...) Marxist intellectuals and especially communist intellectuals must be portrayed as either passive victims or impostors, the mere victims of a gigantic conspiracy. They should not have been able to think by themselves*[71]

Translated by: Ignacio Rial Schies

69 Althusser 2005, p. 179

70 Ibidem

71 Balibar 1993, p. 2

Bibliography

Althusser, Louis 1967, *Sobre el trabajo teórico. Dificultades y recursos,* Barcelona: Anagrama.

--------- 1969, 'Freud and Lacan', in *New Left Review I|55.*

--------- 1971, *Lenin and philosophy and other essays,* New York and London: Monthly Review Press

--------- 1976, *Essays in Self-Criticism*. New York: NLB.

--------- 1990, *Philosophy and the Spontaneous Philosophy of the Scientists & Other Essays*. New York-London: Verso.

--------- 1997, *Écrits philosophiques et politiques*, Tome II, Paris: Stock-IMEC.

--------- 2005, *For Marx,* London, New York: Verso.

--------- 2008, "Filosofía y Ciencias Humanas" en *La soledad de Maquiavelo*, Madrid: Akal.

Althusser, Louis; Badiou, Alain 1969b, *Materialismo histórico y materialismo dialéctico*, Córdoba: Pasado y Presente.

Althusser, Louis; Balibar, Étienne 1970, *Reading Capital*. New York: NLB.

Badiou, Alain 2005, *Metapolitics,* New York-London: Verso.

--------- 1967, The (re)commencement of dialectical materialism. Critique 240, May 1967.

Balibar, Étienne 2004, *Escritos por Althusser*, Buenos Aires: Nueva Visión.

--------- 1993, "The non-contemporaneity of Althusser", in Kaplan, Anne and Sprinker, Michael, *The Althusserian legacy,* New York: Verso.

Freud, Sigmund 2010, *The Interpretation of Dreams*, New York: Basic Books.

D'Hondt, Jacques (comp.) 1973, *Hegel y el pensamiento moderno. Seminario Dirigido por Jean Hyppolite*, México: Siglo XXI.

Hall, Stuart 1985, "Signification, Representation, Ideology: Althusser and the Post-Structuralist Debates." *Critical Studies in Mass Communication,* Vol. 2, N°2, June

Marchart, Oliver 2009, *El pensamiento político post-fundacional. La diferencia política en Nancy, Lefort, Badiou y Laclau*, Buenos Aires: Fondo de Cultura Económica.

Miller, Jacques Alain 2007, *La angustia lacaniana*, Buenos Aires: Paidós.

Sánchez Vázquez, Adolfo 1975, "El teoricismo de Althusser (Notas críticas sobre una autocrítica)". *Cuadernos políticos,* N° 3, enero-marzo, México, pp.82-99.

Šumič, Jelica 2011, "En el camino del semblante", *Debates y combates* N° 1, Buenos Aires, pp. 41-74.

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The Mismeasure of Thought: Some Notes on Organization, Scale and Experimentation in Politics and Science

Gabriel Tupinambá

Abstract: This text is a new instalment in the ongoing research project carried out by the *Circle of Studies of Idea and Ideology* on the notion of an "impersonal emancipation". By this, we understand the proposition that the perspective from which one should probe and evaluate the effective features of our political space should not be that of individual consciousness and experience, but rather the artificial perspective generated by organizational processes of competing levels of complexity and abstraction as the political space we seek to grasp. In order to further our comprehension of this idea, we will read Fredric Jameson's concept of cognitive mapping through Hayek's theory of social complexity, Alain Badiou's phenomenology and Robert Rosen's approach to model theory.

Key words: collective organization, cognitive mapping, modeling

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> " at a time when the universal nature of spiritual life has become so very much emphasised and strengthened, and the mere individual aspect has become, as it should be, correspondingly a matter of indifference, when, too, that universal aspect holds, by the entire range of its substance, the full measure of the wealth it has built up, and lays claim to it all, the share in the total work of spirit that falls to the activity of any particular individual can only be very small"
>
> *Phenomenology of Spirit,* Hegel

> 'How mad would he have to be to say 'He beheld
> An order and thereafter he belonged
> To it?"
>
> *In a Bad Time,* Wallace Stevens

§1

This text is a new instalment in the ongoing research project carried out by the *Circle of Studies of Idea and Ideology* on the notion of an "impersonal emancipation"[1]. By this, we understand the proposition

1 The original formulation of the term was presented by Oliveira 2015. For previous contributions to this research, please refer to Tupinambá 2014, pp.219-236, Tupinambá 2016, pp.156-193; CSII 2017, pp.347-364. As well as Yuan Yao's contribution to this same issue of Crisis and Critique. In Portuguese, a more comprehensive bibliography can be found here: https://www.ideiaeideologia.com/o-circulo

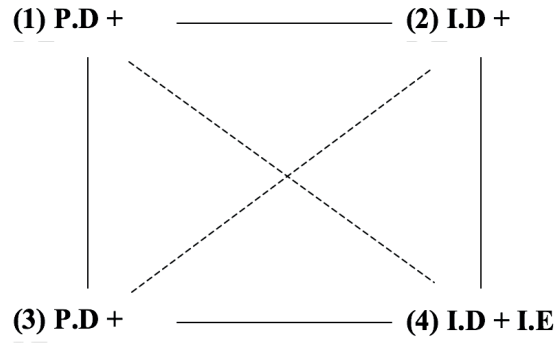
that the perspective from which one should probe and evaluate the effective features of our political space should not be that of individual consciousness and experience, but rather the artificial perspective generated by organizational processes of competing levels of complexity and abstraction as the political space we seek to grasp.

Taken solely as a claim about the analysis of capitalist societies, this proposition does not add much to the Marxist tradition of ideology critique and critique of political economy, both of which have always emphasized the mystifying effects that accompany the self-transparency of our personal experiences. It is rather as a *constructive* thesis about political militancy that the proposition of "impersonal emancipation" gains some interest, as it places new constraints on how we might approach key components of political life, especially the question of collective organization. What would it mean to think political organizations not as "instruments" in an already constituted strategic view, but as "organs" capable of interacting with a dimension of social reality that is both epistemologically and ontologically inaccessible to us as individual militants?

In this contribution I will approach this theme by arguing for the pertinence of three notions which have become important operators in this research, but which still lack any proper elaboration within this context. These are the concepts of *organization*, *experimentation* and *scale* - and, more importantly, their articulation within the sphere of collective political constructions. Through a debate with Fredric Jameson's concept of "cognitive mapping", I intend to argue that collective organizations - due to the very thing which makes us usually distrustful of them: their tendency towards *autonomization* from those who participate in them - can function as an alternative synthetic perspective from which to evaluate and intervene upon the political world. However, this thesis depends on a perspective-shift, from an approach to politics based on "experience" to one based on a political concept of "experimentation". Furthermore, the process through which organizations paradoxically detach themselves from their material basis, and which demands us to associate thinking to political experimentation, does not only lead us into an impersonal or formal space, but also implies the possibility of a change in the *scale* through which actions and agency are conceived.

§2

But before we can engage with these three concepts, it is important to understand how they emerged, still as vague notions, within the study of impersonal emancipation carried out by *CSII*. The scope of this research project can, in fact, be delineated through a rudimentary schematism, linking two oppositions: personal/impersonal (P/I) and domination/emancipation (D/E).



Let us briefly walk through them:

1. One can maintain that capitalism is a social form that is based on personal relations of domination (**P.D**), power structures which are masked under the mystifying abstractions of economy and value. If this is the case, then the struggle against capitalism, in order to be effective, must also be a personal or direct struggle between key social groups, and victories and failures are to be evaluated in terms of personal loss and gain on both sides (**P.E**).

2. One can maintain that capitalism is a social form in which, perhaps for the first time, social domination is truly abstract (**I.D**) - and excessive personifications of its power are in fact how one loses track of its actual logic. But if we are held in check by abstractions, then our struggle against capitalist sociality must be directed towards the concrete, in order to avoid getting caught up in these impersonal circuits (**P.E**). A consequence of this position is that the evaluation of what it means to transform the world becomes caught up with the difference between the concrete and the abstract: the more impersonal the world remains, the less we have changed it.

3. One can, on the other hand, agree with the critical assessment of

the first position, but disagree with the orientation of our political struggle, defending that capitalism remains caught up in the history of direct violence and domination (**P.D.)** and that is precisely why we must fight for the proper establishment of abstract and impersonal structures, based on common rationality and formal liberties, for example (**I.E.)**. In this case, just like in the second position, the criteria for evaluating failure and success remains entangled, but in reverse, with the increase or decrease in personal or impersonal social relations.

4. The last position agrees with the second in defending that capitalism is essentially an abstract form of domination (**I.D**), but it also agrees with the third position, affirming that our struggle must move within the realm of impersonal abstractions (**I.E)**. In a sense, it also agrees "ontologically" with the first position, in that it also maintains that there must be a certain common terrain between causes and effects, problems and solutions, and therefore seeks to evaluate social transformation within the sphere of abstractions and impersonal relations.

Even though positions **(3)** and **(4)** both feature the idea of a struggle towards or within the impersonal, it is only the fourth one which truly spells out the specific constraints of our current research[2].

The first condition, already implicit in the very connection between **I.D** and **I.E**, is that we adhere to a principle of "ontological homogeneity"[3]: the principle that causation and entailment depend on a certain common logical space, without which one element cannot affect another - in other words, only certain forms of abstraction have the adequate "infrastructure" to intervene upon other homogeneous abstractions. This first condition implies, therefore, that "impersonal emancipation" cannot only mean emancipation *from* the personal, rather pointing to a different *domain* of struggle, which might very well be indifferent to our individual or concrete situations. It is within this discussion that the notion of "scale" has emerged as a crucial theoretical question, since approaching

2 Evidently, it is not a matter of arguing which one of the four positions best describe the actual world of radical politics, as much as recognizing that the fourth position is the least developed one of them. Regardless of how we view the interaction of these different poles in concrete struggles, or which currents of political thought we might try to map onto them, the fact remains that it is in our best interest to deepen our understanding of what "impersonal emancipation" might effectively mean.

3 This principle was first developed in the context of a Žižekian theory of transference, in Tupinambá 2016, pp.133-146

impersonality and abstraction as *domains* or *spaces* implies a theory of how different levels of sociality might co-exist with a certain degree of indifference to each other.

The second constraint of our research informs the first one as morphogenesis informs morphology - it is the principle of "autonomization"[4]: we do not assume the existence of a given formal field, but rather approach it through a consideration of the processes through which such "affective" and logical spaces are effectively constituted. This principle further informs what "impersonal emancipation" might mean, since it includes into the consideration of abstract spaces both the problem of how to subjectively relate to what comes to exceed us personally and the problem of identifying and taking hold of the means capable of objectively generating such independent spaces. It is primarily this question - the understanding of how structures can gain autonomy over their structuring conditions - which has led us to a renewed confrontation with the notion of organization.

Finally, a third constraint that comes with adopting the perspective of impersonal emancipation addresses the need for *cognitive unification* of our critical and constructive models - we could call it a principle of "world-building"[5]. Given that there is an ontological homogeneity between domination and emancipation (first condition), and given that this logical homogeneity is not guaranteed, but must be somehow generated and maintained (second condition), then it is also required of a project of impersonal emancipation that it be able to reformulate capitalist problems from within the perspective of this new "transcendental" point of view. For example: a theory of impersonal emancipation cannot be a theory for militants *about* the society of work - understood as the "other" of our own political project - it must rather be a theory *for militants in a society of work*, constructing a unified metric for dealing with work, leisure and political activity[6]. The need to produce unified models in which both our critical analysis of reality and our extrapolations towards future events are held together not by our conscious activity or our ideals, but by a single theoretical model brought

4 See *Real Abstraction and the Autonomization of Value* in Crisis and Critique Special Issue Vol I, n.II, pp.131-147

5 Discussions surrounding the need to "own the means of production of problems" in CSII have appeared in the debate between Gabriel Tupinambá and Edemílson Paraná through the virtual platform of the Boitempo publishing house - a co-authoured book, with the participation of Sabrina Fernandes, is currently under preparation.

6 See Tupinambà 2017.

us to the notion of “experimentation” as the name of a certain type of activity which “tests” hypotheses about the world which are inaccessible to any sort of direct experience.

Organization, scale and experimentation - these three ideas are in fact deeply interrelated here: the capacity for organizations to acquire some autonomy over those who constitute it can lead us to an indirect participation in spaces whose alternative scale make them logically irreducible to the measure of our individual experiences - spaces, therefore, which we can learn about only through experimentation, rather than through any sort of direct access. These experiments - which, respecting the principle of homogeneity, would have to be organizational in nature - can interact with other forces of similar ontological constitution - insofar as they are formally homogeneous in terms of the scale in which they consist as causally efficacious entities - leading us to situated knowledge of these abstract structures as well as a more reliable metric to the effects of our interventions.

§3

In a famous essay from 1998, Fredric Jameson put forward the concept of "cognitive mapping" - in fact, this term was presented more as a challenge than as a concept, since it would involve producing "the concept of something we cannot imagine" (Nelson & Grossberg, 1998)[7]. The task at hand, complicated by the fact it taps into the domains of artists and art critics in order to recuperate the didactic function of aesthetics, proposes an extrapolation of Kevin Lynch's theory of the "mental map of the city", presented in *The Image of the City* (Lynch), to the "totality of class relations on a global (...) scale" in a way that also lead to a new interpretation of Louis Althusser's famous definition of ideology as the "imaginary representation of the subject's relation to her real conditions of existence" (Althusser,). Just as Lynch associated urban alienation to the incapacity of city dwellers to represent for themselves the structure of their own urban spaces, Jameson seeks to define a special type of aesthetic alienation which prevents political actors from picturing the complex social and economic structures in which they move.

To track this dimension of aesthetics, Jameson proposes a periodization of three stages of capitalism, indexed by the way the spaces of capital's

7 The most comprehensive and interesting use of the concept is not to be found in Jameson's work, but in the book by Toscano and Kinkle 2015

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self-valorization relate to the phenomenological constitution of the individual's world[8]. Firstly, there is the phase of "market capitalism". Here, the process concerns not so much the spatial expansion of capitalism so much as the transformation of "some old sacred and heterogeneous spaces into geometrical and Cartesian homogeneity, a space of infinite equivalence and extension", the "slow colonization of use value by exchange value" (1998). Aesthetically, the figuration of such new world gives rise to different forms of realism, that is, to the need of representing a social situation that remains of a similar "scale" as previous social formations, but which is now held together by a secular transcendence. In other words, the subjective experience of the world - the basic material for art - was at this point still conformal with the social and economic life which allowed for such individual experience space, what had changed was mostly the shift from a religious to a secular explanation of how these two poles related to one another.

However, this minimal compatibility between "a phenomenological description of the life of an individual and a more properly structural model of the conditions of existence of that experience" would be broken by the second phase of capitalism, that of imperialism or "monopoly capitalism" (1998). Here, and specially with colonial expansion, a scission is produced between lived experience and social structure, so that what is phenomenologically available to the individual "becomes limited to a tiny corner of the social world" while the conditions for such experience are scattered throughout the globe. This brings about a situation in which "the truth of that experience no longer coincides with the place in which it takes place" (1998) - the more one experiences one's individual situation as an authentic one, the furthest away from the truth of that experience one is. This underlying tension informs, ultimately, the historical conditions for modernism, in all its different orientations: to seek formal strategies to circumvent and tackle the fact that there is no continuity between the individual apprehension of the world and the social structures which conditions the individual experience of oneself and others.

But this scission - so easily recognizable as a main theme in XXth century's art as well as philosophy - still presupposed some basic *unity* within each of these incongruent domains. Imperialism, after all, was based on the staggering expansion of a certain common logical space, just as critical theory recognized identity and uniformity as the markers

8 A more detailed analysis of this periodization is presented in the book which developed the intuitions of this original essay, Jameson 1992

of bourgeois individualist ideology. This basic assumption, however, is challenged in the "late capitalism" phase, which Jameson also calls that of "postmodernism". Here - which is where we currently are - we must no longer account only for a discontinuity between the individual experience and social structures of an expanding capitalism, but rather for the simultaneous discontinuities which compose the "multidimensional space" of a capitalism itself - which, at places, still preserves islands of "bourgeois private life", while at others disperses itself in the "unimaginable decentering of global capital itself" (1998). This new situation can no longer make do with an indirect access to a larger, but intrinsically homogenous social space, through reference to formal experiments which are capable of cognitively inscribing us into an arid field of social sense. Instead, it exposes us to a further decomposition of that original secularization process of the transcendental: its *multiplication* into several heterogeneous and fragmented spaces, unsynthesizable by a single social logic. A sign of the deadlock imposed by this new situation, Jameson suggests, would be the increasing auto-referential character of contemporary art, its reliance on - and almost coincidence with - the multiple technical and technological means of aesthetic expression available today as well as the "omnipresence of the theme of paranoia, as it expresses itself in the seemingly inexhaustible production of conspiracy plots of the most elaborate kinds" (1998).

Jameson's focus, however, is not with artistic practice, nor with the historical conditions for art critique today. His concern with cognitive mapping stems from the fact that the capacity to map the complex world of contemporary capitalism bears directly on the capacity of political practice to act upon it, and to evaluate and transmit the result of these actions: there can surely be a politics that outright abdicates from any attempt to localize itself with respect to capital as a historical totality, but without this mapping, "there can be no socialist politics" (1998). The example of the the Black Revolutionary Workers, in Detroit in the 60's, is mobilized by Jameson to demonstrate that the issue of how to *generalize a political model of relative local success* brings the problem of cognitive mapping into the center of very practical political concerns. "How to build a national political movement on the basis of a city strategy and politics", "how to represent a unique local model and experience to people in other situations" (1998) - these questions involve the underlying problem of how to cross certain scale-thresholds that separate political organizations and the space in which they act without the access to some basic element in the local configuration which would guarantee us a coherent representation of the whole.

Nancy Fraser, in the occasion when Jameson first introduced this proposal, was quick to ask why such a task should have anything to do with aesthetics - "why wouldn't it be a task for critical social science?" (1998) - to which Jameson answered with a reference to the Althusserian distinction between science and ideology. Science would have access to the real precisely because its formal models are independent from the individual space of experience, while the problem of cognitive mapping concerns, like Althusser's theory of ideology, how one represents the complex conditions of existence in capitalism to these very subjects. Unlike Althusser, however, Jameson has a more ambivalent understanding of what "representation" means: rather than treating it "as the synonym of some bad ideological and organic realism or mirage of realistic unification", Jameson considers it as being essentially a matter of "figuration" (1998) - a problem of giving *form*, rather than of giving *sense*, to something. This alternative approach allows him to separate two problems that are indistinguishable in Althusser's theory: there is the question of ideology - of how representations mediate our access to the social reality - and there is the question of alienation - of the different capacities of these representational spaces to map and model the properties of our real conditions of existence. There can be, therefore, ideologies of different degrees of alienation, insofar as there are different ways to "picture" the complexity of our social world. The "crisis in Marxist ideology", as Jameson calls it, derives in part from the abdication of the challenge to produce a representation of the world from the standpoint of socialism, within which - and against which - capitalism could be pictured in its totality.

But while there are unquestionable merits in shifting the emphasis from the question of meaning to the question of form in matters of representation, Jameson's answer to Fraser moves too quickly in equating the aesthetical challenges of cognitive mapping with the realm of the ideological. The issue concerns not so much the problem of "mappings", but rather the presuppositions that come with the qualification of their "cognitive" purpose. It is most certainly true that, amongst the conditions of modern science, there is the requirement that the statements and derivation rules that compose different formal systems be allowed an intrinsic formulation, so that one might follow them beyond the point where scientific statements concur with our conscious individual intuition. But by abiding to Althusser's definition of science as a process (ideally) "without a subject" - a view very much in line with the French epistemological tradition, always keen

on downplaying the experimental dimension of science, epitomized by Francis Bacon, in favor of the more "platonic" scientific genius of Galileo - Jameson ends up discarding another crucial distinction that could be introduced into this problematic, the question of the underlying organizational procedures which allow scientists to arrive at a point of view which is not in the measure of their own individual existences. Rather than distinguishing science and ideology in terms of "subjectless" and "subjective" modeling strategies, one might therefore separate the two by stressing that ideology is the imaginary representation of the real conditions of existence for *an individual subject* - in opposition to "figurations" which might be accessible *only within organized practices where subjectivity and individuation are not coincidental*.

This distinction is impossible, however, when our reference to "cognition" already implies "commensurability with consciousness". A reference which also clouds the fact that Althusser's theory of ideology did not simply deal with how the complex reality of capitalism is deformed into representations that "naturalize" this reality, rather stressing that ideological interpellation takes place through concrete practices that participate in the process of our own subjective individuation. The question of cognitive mapping could, if extended in this direction, cut across the science/ideology divide: there are representational spaces which map *onto* the individual subject, while others map onto *other* individuated instances - for example, the writing material of a set of theorems in a formal system or, perhaps, the body constituted by a collective political organization[9].

The concept of cognitive mapping brings us back, in this way, to the three terms we previously singled out: the question of how to *organize* practices which project the individual subject onto a formalism that is commensurate with the *scale* of social processes, removing us from us the our space of subjective experience in favor of an *experimental* capacity to picture and "sense" information about this otherwise inaccessible social and political space.

9 This is exactly what Alain Badiou accomplishes with his theory of the communist Idea - he writes: "the communist Idea is the imaginary operation whereby an individual subjectivation projects a fragment of the political real into the symbolic narrative of a History. It is in this sense that one may appropriately say that the Idea is (as might be expected!) ideological." (Badiou 2010 p.5). Notice here that the Idea is defined by the subjectivization of the individual by a political real, not by the reduction of politics to the measure of the individual.

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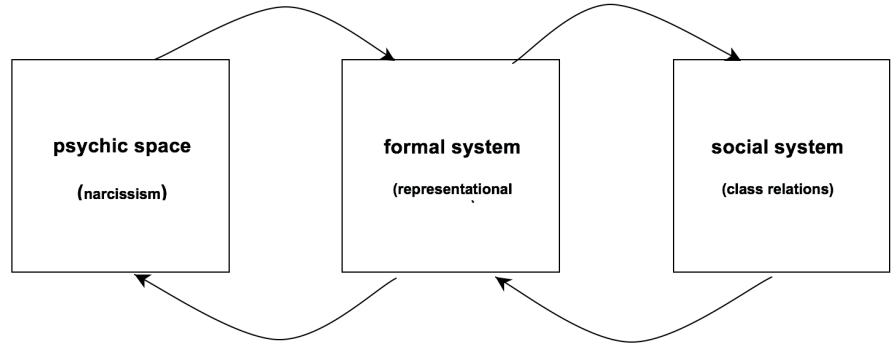
§4

Through Jameson's schematic periodization of three historical sequences, we tracked the changing relations between "a phenomenological description of the life of an individual and a more properly structural model of the conditions of existence of that experience", looking to understand under which conditions the latter could be made to "fit" with the former - a matter of ideology, while the opposite fit would concern science. Jameson called these relations "models" or "maps", emphasizing that these different sequences do not simply pose challenges of how to represent the "content" of social relations - questions of who or why things are the way they are - but rather of producing new *forms* for the figuration of the social world. This suggests that the underlying ontology behind the theory of cognitive mappings deals not in "individuals" and "collectives" as two substantial strata, so much as in terms of how to correlate the organization of individuals (i.e. narcissism), the organization of representational spaces (aesthetics) and the organization of complex social structures (political economy) - an alternative reconstruction of his proposal which takes seriously the idea that cognitive mappings are concerned with *modeling formal relations* and not only with "making sense" of capital.

This approach also has the benefit of localizing our critique of Jameson's more phenomenological take on cognition, since it distinguishes *two* mappings, rather than just one:



With this tripartite construct, we can distinguish between mappings that represent the world to "individual subjects" - themselves understood here as *particular mappings between representational spaces and individual self-apprehension* - and those mappings which represent the social world to some other synthetic "cognate", itself incongruent with our

self-apprehension, and which therefore demands of us some preliminary conformity process if we are to have access to what this intermediary space can apprehend in terms of information about the social totality. So, when we think cognitive mapping in terms of the partial conformity of three different "types"[10] of organization - personal, representational and social - themselves "mappable" to each other not due to their *material* - since psychic representation, artistic and scientific forms and social relations are "made" of different things - but due to their *organizational* structure, we also unearth two hidden parameters in Jameson's idea.

Firstly, as we already mentioned, the aesthetic problem of mapping social structure onto lived experience brings into play the problem of how to "conform" *both the world and the individual* to a formal space that is somewhat independent of them - this would be, for example, the problem of how to orient oneself "subjectively" in a domain "without a subject", in the case of mathematics, or, better put, how to *displace the point of synthetic apprehension* from our cognitive standpoint to that of the formalism itself. It is this displacement which ideology *prevents* us from accomplishing - since it reduces the world to the measure of what can be individually *experienced* - and which scientific practice allows us to participate in - through the artificial engagement with practical *experiments*[11].

But more than this: when we distinguish between three, rather than two, terms in this modeling relation, highlighting the practical and artificial status of experiments and formal systems, and therefore the challenge of how individuals relate to them, we also create a separate index to account for two ways in which cognitive mapping might be hindered by organizational transformations in social history: there can be a deficit in the modeling capacities of formal systems - be them artistic or not - as well as a deficit in our capacity to "accede" to the synthetic standpoint of these models - either due to the complexity of the formal system, or due to the effects of the social system onto the individual's own organization. This, in fact, could perhaps justify a slight alteration in our schema:

10 For the sake of this study we have not discussed what it means to distinguish between "types" of organization and what is the relation between organizational spaces and their material substrates. This additional investigation - in fact a central one - will be the topic of our next contribution.

11 An alternative formulation of this same distinction can be found in *Organization and Political Invention* (CSII, CT&T) under the theory of ideology as "instituted ignorance".

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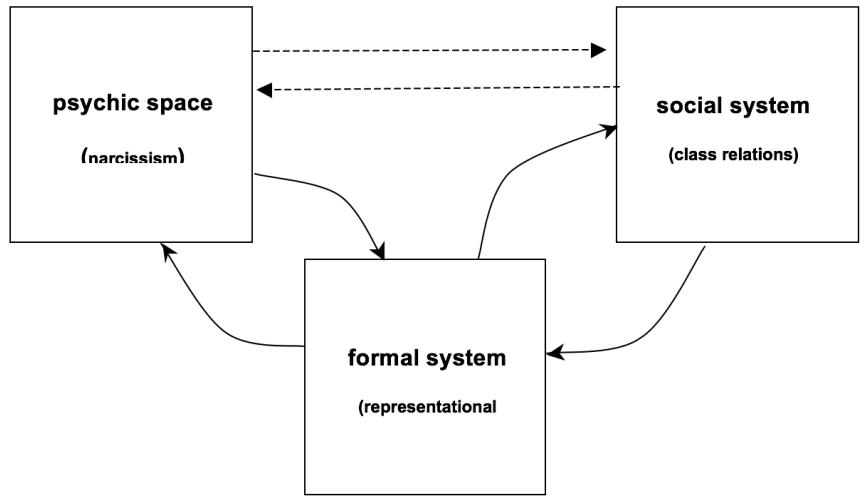

These dotted vectors - closer to causal relations than modeling ones - make explicit that transformations in capitalist society can lead to new constraints on how individuals might relate to the possibility of alternative synthetic perspectives.

Jameson justifies the ideological character of cognitive mapping by claiming that "you can teach people how this or that view of the world is to be thought or conceptualized, but the real problem it is increasingly hard for people to put that together with their own experiences as subjective individuals in daily life", adding that "the social sciences can rarely do that (...) they do it at the moment that social science becomes an ideology, and then we are back at aesthetics" (1998). This explanation in fact reinforces our alternative reconstruction of Jameson's idea, as it distinguishes between the capacity of social science to capture relevant information about social relations from its capacity to remain commensurate with individual subjectivity. When he claims that "aesthetics is something that addresses individual experience rather than something that conceptualizes the real in a more abstract way" (1998) we can read this claim in two ways: as a general principle that rules over the *two* mappings, serving both as an evaluation criteria for how well individuals can relate to a formal apparatus and for the formalisms own capacity to model complex social phenomena, or as a special principle, which concerns the question of how we might incorporate ourselves into the alternative synthetic point of view created by a formal procedure. By not distinguishing between the two, Jameson ends up flirting with a rather populist approach to political thinking, in which the need to tailor political processes to the measure of individual consciousness gives

an *epistemological value* to the discursive strategies that allow us to signify social complexity, as well as to individual leaders who represent the individual perspective within the political sphere, instead of allowing us to formulate the issue of political adhesion as the additional - even if overlapping - question of how individuals might interact with useful cognitive maps that nonetheless do not map "onto us".

§5

There is an interesting schism to consider in Jameson's periodization of the three phases of capitalism, most notably with the consolidation of the disparity between lived experience and social structure in the imperialist sequence. The famous question of social planning versus market economy could in fact be approached through the prism of cognitive mappings, because the moment that capitalist economy established this cognitive disruption between our capacity to experience the world and the social structure underlying this experience, two political solutions were proposed to this predicament. Before capitalism brought about the incommensurability between the lived and the structured, we could say that modernity was defined, as Jameson proposed, by the task of becoming *responsible* for the previously transcendental destiny of society. Leftists and conservatives were both concerned, at least since the French Revolution, with the double challenge of conceptualizing social organization without the aid of a transcendental guarantee, basing it rather on work and the understanding of individual and social needs - hence the birth of classical political economy - and of picturing in which direction we would like society to develop - hence the birth of Leftist and Right-wing orientations in politics. This meant that politics was trapped between two simultaneous commitments: one to *social totality* - the task of thinking the general logic of social interactions - and another to *political responsibility* - the task of envisioning society as something which we must account and answer for, individually and collectively. These commitments were largely compatible, insofar as "market capitalism" still adhered to social structures basically commensurate with our individual phenomenological space, where the concept of responsibility had a clear meaning.

However, with the colonial consolidation and the rise of monopoly capitalism, these two commitments become increasingly incompatible, and - risking here an absurd simplification - we could say that the Left became increasingly defined by the political task of social responsibility, while liberalism established itself by focusing almost exclusively on

the theoretical requirements of dealing with social complexity. This is reflected, for example, in the tendency of XXth Marxism to ontologize labor as a sort of basic - and highly reductive - formal principle for the modeling of social structure, a constructivist approach which allows us to track responsibility throughout social formations by adhering to the underlying transitive principle that we can map the totality of class relations by following what happens to manual workers, insofar as they form the building block of society as a whole. Strategically, this translates into the search for a way to plan society's direction by controlling the interaction of its constitutive parts. Historically, it appears today as the almost absolute inhibition before the history of XXth century socialism, as we become trapped between the need to be fully accountable for the disasters that took place and incapable of doing so without some theory of complex autonomization[12]. Theoretically, still, this focus on social responsibility could be considered "materialist" because it found direct analogies with well-known ideas from physics and thermodynamics, which had promoted, with classical mechanics, the view that one can in fact predict future states of a system by an analytical investigation of the previous states of its constitutive parts[13]. But this approach also created an increasing schism within Marxism itself, which Slavoj Žižek has called a "parallax" between the critique of political economy - which had to follow the developments and increasing abstract character of the value form in capitalist societies - and the political view of militancy - which still sought to orient itself by what could be directly perceived and accounted for "on the ground" of social relations[14], a dualism which arguably still structures most debates within the Marxist practical and theoretical field.

But for those who privileged the problem of socio-economic complexity over the question of political responsibility, claiming that the most responsible thing to do politically was to let the market "decide" the best social equilibrium between its interacting parts, the theoretical challenge was quite distinct. Friedrich Hayek, perhaps the paradigmatic example of this approach, was quite aware that social complexity required us to rethink the capacity of individuals to grasp "at once" the information and knowledge needed to steer society one way or another. In *Rules*

12 See Hamza and Tupinambá 2016, pp.427-441

13 See Rabinbach 1990

14 Žižek 2006, p.283

and Order[15], the first volume of *Law, Legislation and Liberty*, he argues against the "cartesian" view that men always make their institutions in accordance to a predetermined design, and that the better an institution responds to this design, the better it is for society: "it is simply not true that our actions owe their effectiveness solely or chiefly to knowledge which we can state in words and which can therefore constitute the explicit premises of a syllogism. Many of the institutions of society which are indispensable conditions for the successful pursuit of our conscious aims are in fact the result of customs, habits or practices which have been neither invented nor are observed with any such purpose in view."[16] For Hayek, it is precisely because the most important social institutions are born through the complex and impersonal interactions of our habits and social existences that they are commensurable with the equally complex and impersonal production of knowledge about society by society - the most important of these institutions today being that of *market price*[17]. By constraining the design of institutions to the "size" of our individual cognition, we also constraint their capacity to acquire meaningful information about the social totality.

It is worth understanding the basis of Hayek's argument, as it contains, despite his dire political conclusions, some brilliant insights into the correlations between the three organizational spaces we have distinguished in Jameson's concept of cognitive mapping. To follow his theory, we must understand the distinction between "explicit" and "implicit" rules (Rules and Order): the former are rules which are relatively simple, so that we can state them in general form as a commandment that can be executed, while the latter are *impredicative*, or at least too complex to be reduced to a general statement in a natural language - we can know an implicit rule only by examining a certain set of its applications and recognizing certain local and regional patterns. Hayek is particularly interested in showing that explicit rules are just a case of lower *complexity*, they describe simpler phenomena - usually those that can be understood as mechanical ones, and thus relate to systems that, like a machine, can be artificially *designed and fabricated*. Orders that are the spontaneous product of the interaction of several irreducible parts, and which therefore produce spaces of higher degree of complexity, are *not* isomorphic with machines and therefore cannot

15 Hayek 1973

16 Hayek 1973, p.11

17 Hayek 1945

be stated as these simpler rules or ordenation principles. To use the terminology proposed by Stephen Wolfram (New Kind of Science), we could say that classical mechanics, dealing with natural phenomena that are isomorphic to a mechanism, is of a lower degree of complexity than the human mind and its cognitive capacity, hence mathematics was able to model them into explicit formal rules, capturing the law of certain phenomena "at once" through a formalism of higher complexity. The human mind, however, is "computationally equivalent" - its equally as complex - to another mind, which is why it cannot grasp its own rule structure into an explicit model, and, furthermore, it is potentially *less complex* than the system formed by the social interaction of men, which is then "computationally irreducible" to our conscious apprehension.

By first performing this critique of the possibility of adopting a reductionist approach to economics, barring the generalization of formalisms from classical physics to social phenomena, Hayek opens up the question of *how* the human mind, with its either equal or lower degree of complexity, might grasp information about the social system it inhabits. This is where social institutions displaying a higher degree of complexity that our own design could endow them with come into play: prices, for example, arise not by human design, but through the interactions of commodity exchange - but precisely because of this, prices can capture information about the general implicit rules of society which could not be otherwise made intelligible. In a decentralized and partial way, "the price system [is] a kind of machinery for registering change, or a system of telecommunications which enables individual producers to watch merely the movement of a few pointers, as an engineer might watch the hands of a few dials, in order to adjust their activities to changes of which they may never know more than is reflected in the price movement.[18] In other words, Hayek sees that price systems are the formal systems onto which information about society can be mapped - they function as economic cognitive mappings that are too complex for individual cognition, but which can nevertheless be partially read by "the man on the go".

Even though the direct equation between organization and complexity might excessively privilege some of the presuppositions of the cybernetic approach to organization and morphodynamics[19], it is nevertheless clear that Hayek's analysis of the interaction between individual, formal and social systems in terms of their order-structures - complex or simple,

18 Ibid., p.527

19 See Dupuy 2009 and Rosen 1999

spontaneous or designed, etc - reinforces our previous view that the ontological backdrop of the problem of cognitive mapping concerns above all the problem of relating organizations of different "scales" and producing interactions between them which can capture meaningful data about these spaces of irreducible complexity.

As it is well-known, however, Hayek does not go as far as extending his critique of constructivism to include a new concept of social responsibility: his treatment of society as a complex system, and his concern with criticizing the socialist view of economic planning, led him to merely dismiss the political question of political orientation, putting his trust in the capacity of such spontaneous social ordering to find the best equilibrium point between the social fragments it organizes[20]. Still, his understanding of price as special formal systems capable of mediating between social complexity and individual subjects does not only show a remarkable similarity with our view of cognitive mapping as being composed of two separate modeling relations, but it could also help us to shed perhaps an interesting and innovative light into the worn-out theme of commodity fetishism.

§6

Marx famously defined fetishism in the first chapter of *Capital* as the situation in which "the social character of men's labor appears to them as an objective character stamped upon the product of that labor" - but our usual reading of this transformation focuses solely on the types of relations brought into play here: "a definite social relation between men" assumes the "fantastic form of a relation between things". Accordingly, concepts such as "alienation", "reification" and "fetishism" all highlight the fact that what has taken place is the transformation of human relations into relations between objects or objectified people. But this qualitative shift is in fact conditioned by something else, the quantitative - or better, the *scalar* - mismeasure between the two sides of fetishism: it is, after all, not the social relations between *two* men that appears as the relation between *two* commodities, but rather "the sum total of the labor of all these private individuals" that is expressed in the exchange value of any two commodities, or a commodity and the money-commodity in particular.
It is highly significant that Marx distinguishes the fetishistic inversion

20 Jean-Pierre Dupuy, the proponent of a "Leftist Hayekianism", proposed an interesting reading of Hayek's contributions and shortcomings in Dupuy 1989

from the process through which the simple form of value - x of commodity A being made equivalent with y of commodity B - gives rise to the total form - x of commodity A made equivalent to a given proportional quantity of *any* other commodity - and finally to the money-form - where the value of any term in this infinite series of commodities is expressed in terms of a proportionate amount x of a single commodity. We could expect these two processes to be of a same character, insofar as both of them express a vast set of interactions in terms of a simpler or reduced interaction: the sum of human relations in the productive sphere appearing as the relation between a smaller set of commodities, the sum of value relations in the circulation sphere appearing as the relation between these commodities and a particular one, money. But here we see Hayek's distinction between degrees of complexity, between fabricated and spontaneous processes, coming into play: money does in fact capture some information about the general space of value in capitalist social formations - we can orient ourselves locally by comparing prices - because it is a complex and "spontaneous" institution, which we interact with, but cannot fully plan or design, while the relation between a few commodities - placed in exchange due to the design of two or more individual buyers and sellers - is incapable of expressing the "social character of men's labor", given that this social character is of a higher degree of complexity that this equivalence function. It is this second form of transformation - of a complex social system into the individual "scale" - that properly warrants the name of fetishism.

This reading could perhaps justify the addition of a fifth feature to the other four that Marx lists when describing the properties of the money-form in capitalism: measure of value, means of payment, something that can be hoarded, and its function as world-money (Capital). We could add to this list, following Hayek and Jameson, its function of serving as a *decentralized cognitive mapping* of a more complex socio-economic structure. This function is not reducible to that of measuring value because it does not concern the determinate relation between any two given commodities exchanged at a given instant, but rather money's capacity to track, through the fluctuations in price, information about economic crises, political turbulences and other features of the capitalist economic space. That is, while not requiring us to take cognizance of the totality of social interactions, money serves as a mediator between two heterogeneous scales, or levels of complexity, allowing its bearer to have information about processes that are "too big" to be directly grasped - a function that does seem strangely close to the classical modern

aesthetic issues concerning representation and the sublime.[21]

It is crucial to note, however, that this is not an entirely new proposal. In a way, Alfred Sohn-Rethel's claim that the structure of value in market exchange is isomorphic to that of Kant's transcendental subject (Intellectual and Manual Labor) could be read in this precise sense, as a statement concerning the emergence, through the act of exchange, of a synthetic point of view that has its own specific properties and which is therefore irreducible to that of conscious actors of commodity exchange. In *Intellectual and Manual Labor,* Sohn-Rethel was mostly interested in the "genetic" aspect of this correlation, since it provided him with a historical materialist explanation to the rise of philosophical and scientific categories in Western thinking, and he did very little to develop its political implications - mostly using his theory to settle the debate over there being "two sciences", a proletarian and a bourgeois one, and to reiterate a Leninist interest in Taylorism, which he foresaw as a possible opening to another logic of "social synthesis" than that of commodity exchange, a way to capture the complexity of "the total sum of labor" through different formal means. But the general acceptance that social practices can produce new "transcendentals" has certainly other, far reaching consequences.

§7

We have seen (in §2) how the investigation into "impersonal emancipation" is an attempt to think political action in capitalist societies under three conditions or principles: (a) the principle of *ontological homogeneity* between causes and effects, so that abstract forms of social domination might be countered by equally complex and abstract forces and political structures; (b) the principle of *autonomization*, which requires us to rethink how militants subjectively relate to institutional structures and abstractions, as well as what it means to actively and logistically promote the autonomization of political organizations, and (c) the principle of *theoretical unification,* namely, that we do not allow the previous two conditions to segment our theoretical model into a critical one, which analyses capitalism, and a constructive one, which has categories only fit for political struggle - or, in the terms we later developed, this condition states that we should not split our political project into a theory of social complexity that is opposed to our theory of political responsibility.

21 Žižek 1989

After this, we turned to Fredric Jameson's plea for the development of a practice of "cognitive mapping" (§3) that is capable of picturing the space of "late capitalism", which has acquired a degree of complexity and multi-dimensionality which has led previous aesthetic projects into a deadlock. Recognizing that Jameson's challenge taps into the same conceptual field as our less analytical project of impersonal emancipation, we proposed (in §4) a reformulation of his concept in order to highlight (a) that Jameson's phenomenological approach to cognition constraints the analysis of the two separate mappings which a cognitive modeling of society in fact requires and (b) that the first of these two relations, the one that connects individuals to formal systems, could offer us an alternative route, where the synthetic point of view onto which cognitive mapping pictures the world might very well be a "prosthetic" one, immanently created through material practices - as in the case of artificial experimentation in sciences, or through social organization, in politics.

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This led us to a brief analysis of Hayek's theory of prices as decentralized machines that capture partial informations about social complexity (§5). Critical as we are of his political views, we turned to Hayek as he represents the solution that liberalism proposed for Jameson's diagnostics of the schism between lived experience and social structure: while Marxism relied on analogies with mechanics and thermodynamics in order to reduce complexity to the measure of a more classical theory of political subjective responsibility, Hayek brutally minimized the issue of political subjectivity and focused on extracting the consequences for knowledge and cognition of the increasing complexity of market relations in capitalism. Having recognized that his theory of prices demonstrates the epistemological value of formal systems embedded in social institutions and which mediate our access to knowledge of social structure, we turned to Marx's theory of fetishism (§6) to argue that this same property can be found, in implicit form, in his value theory, provided we take notice of the change in scale that underlies the transformation of the "relations between people" into "relations between things" and the transformation of the total form of value into the money-form. We also hinted that Alfred Sohn-Rethel was already aware of the usefulness of these "prothetical" points of social synthesis, when he recognized the role of commodity exchange in giving rise to the transcendental point of view required for philosophy and modern science to effectively emerge.

But we are now back where we started, as the need to force together the perspectives of social complexity - which leads to a view of social

institutions as epistemological mediators in our access to social knowledge - and political responsibility - which brings into play the propositive and strategic dimension of political militancy - amounts, precisely, to an alternative definition of "impersonal emancipation". That is, the capacity to displace to another instance, irreducible to our individual self-apprehension, the synthetic point of view which is capable of "sensing" information about the social space - as an apparatus for cognitive mapping of the world - as well as of offering an alternative metric, only indirectly or partially accessible to us, with which to evaluate the success and failure of our political interventions.

Even though Jameson helped us to introduce the epistemological value of cognitive mappings, it was by moving back from aesthetics to political economy, with Hayek and Marx, that we were able to address the ontology of such a practice, dissecting its basic components not in terms of types of practice - aesthetical, political, and so on - but of organizational spaces and finding in the questions of scale and complexity a homogeneous measure to deal with the constraints of multiple mappings between them. But, as we stated in our introductory remarks, our main concern is not with the development of critical theory, but rather with renewing the approach to collective organization, proposing that we recognize the capacity of certain social institutions to introduce us into dimensions of the political space which are inaccessible from our own direct cognitive stance. And this constructive or propositive view cannot be found either in Hayek nor in Marx, even though it is clearly palpable in Jameson's formulation of the challenge. It is perhaps only in Alain Badiou's thinking that we can find the appropriate tools to bring together Jameson's propositive view while simultaneously exiting the domain of aesthetics as an ideological or superstructural realm[22]. In fact, the three terms we have been trying to implicitly track in this study all have explicit correlates in Badiou's *Logics of Worlds*, a book which remains mostly unexplored in terms of its implications for political practice. There are striking similarities between Badiou's theory of the *subjectivized body* and our approach to the question of "organization", between his *objective phenomenology* and the way we want to consider the question of "scale" and the theory of *organs and decision points* and the question of "experimentation" - even though the proper assessment of these ideas will have to wait another opportunity. For now, let us only introduce a minimal sketch of his conceptual framework.

22 It has been the merit of a fellow researcher, Yuan Yao, to have demonstrated in his text *Value and Appearance* that Alain Badiou's "objective phenomenology" could be used as a basis for a new approach to Marxist value theory, one in which extracts from the theory of fetishism the objective dimension of real abstractions (see Yao). His most recent contribution, featured in this same edition of *Crisis and Critique*, further develops this intuition.

Rather than concerning himself with the ideological interpellation of individuals through material practices, Badiou focuses his theory on the question of "incorporation": of conceiving the structure of processed through which singular individuals can come to *compose* the consistency of a body whose rules and constraints for affection are irreducible to the domain of their own causal existence as individual bodies. In order to distinguish between the "underlying" and the "incorporated" domains - accepting that they constitute at least partially independent logical spaces, with their own rules of entailment, negation, etc - Badiou develops a revolutionary approach to phenomenology, demonstrating that we do not need any reference to a subject, an spectator or a consciousness in order to distinguish between the "standpoints" from which an organization appears as just a collection of individual bodies of its members and the perspective from which it consists as a somewhat autonomous body of its own. These two "transcendentals" - leading to two distinct "scales" of existence, of "many individuals" and of "a collective" - are in fact objectively inscribed in the formal constraints of the logical space in which the organization is inscribed. But for this approach to be properly consistent, then the theory of how we might *compose* bodies irreducible to our own measure must be supplemented by a theory of how we might *dispose* of these alternative metrics, given that it has no transitive relation between the indexing of objects by two different transcendental standpoints. This is where the concept of "organs" is introduced, as the set of operations a body can locally produce in order to index the rest of the world to its own "measure", a form of treating the world so that information formally and logically compatible with the standpoint of the body can be produced. Having no means to dispose of an experience of the world from the standpoint of the collective as a body, we still can produce experiments which, point by point, uncurtain the concrete effects of such a body in *its* world.

§8

The movement between the theory of cognitive mappings and Badiou's objective phenomenology might seem hard to justify at first. In fact, nothing could seem farther away from Jameson's call for an aesthetic discipline than Badiou's use of category theory. Is this recourse to arid formalisms not, after all, precisely what Jameson sought to avoid when he opted for inscribing the project of cognitive mappings into the ideological rather than the scientific domain[23]? An answer here requires

23 A good measure of the incompatibility between Jameson and Badiou can be found the former's account of the latter's work in Jameson 2016

two steps: first of all, Badiou's philosophical approach to phenomenology is not directly concerned with politics or art - it is not even directly concerned with our own world: the stakes of *Logics of Worlds* are rather set by the task of thinking what it means to "appear" in the most general possible sense. The recourse to mathematics is warranted precisely because it offers us a situated and determined way to think no situation in particular - and, in the case of category theory, it offers us a very rich and sophisticated approach to mappings in general. This leads us to the second part of the answer, as there is in fact a direct passage from the topic of mappings between natural, social and formal systems to category theory.

"The domain of mathematics lies entirely within the inner private, subjective world; ironically, however, that domain is also considered the most objective of realms" [24]- this is how Robert Rosen introduces his approach to theoretical biology, through category theory. A considerable part of his work has been dedicated to the question of the appropriate formal approach to biology and one of the cornerstones of this project is the affirmation that "inferential entailment (between propositions) and causal entailment (between external events) are the only two modes of entailment we know about"[25]. From the "surprising fact (...) that these two different realms of entailment run so much in parallel"[26], Rosen constructs both his critique of a certain type of modeling relation established between them - very much akin to the improper generalization from physics and mechanics into other realms, which we briefly mentioned - as well as his own alternative approach.

At the heart of his project lies a profound intuition: that the study of modeling relations between formal systems can function as a sort of "back door" into the modeling relations which we establish between formalisms and natural systems. Since the inner workings of causal entailment remain, in themselves, beyond the grasp of a scientific approach, the proper way to study how a certain theory might "read the book of nature" is to construct a sort of speculative laboratory, composed only of formal systems, so that we can look at what it means to capture the determinate forms of entailment of a system through another. This intuition, which leads the theoretical biologist towards an engagement with category theory, in fact relies on an understanding of mathematics

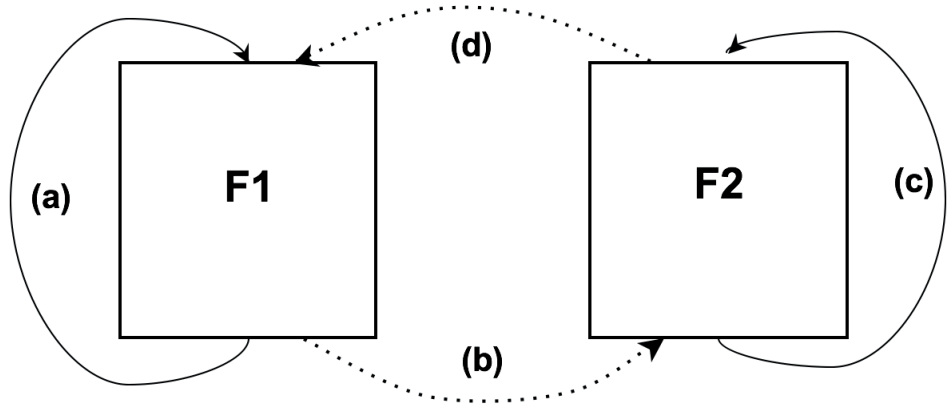
24 Rosen 1999, p. 89

25 ibid

26 ibidem

and mathematical modeling that can be equally found in the works of Albert Lautman and Alain Badiou, namely, the recognition of a dialectics of homogeneity and heterogeneity within mathematics.[27] Regions of mathematics are homogeneous enough to each other so that we might interpret the formal propositions of, say, geometry, through algebra - but, at the same time, these regions are heterogenous enough so that such relations do not result in a mere tautological re-statement of the initial formal propositions. A non-geometrical treatment of trigonometrical series can lead to new discoveries - like Cantor's set theory - just as modeling number theory through logical propositions led Frege to revolutionize formal logic.

A first approach to the question of modeling requires us to consider this very simple diagram:



Here we have two formal systems, **F1** and **F2**, with their respective inferential structures, **(a)** and **(c)**, and the two extra mappings which compose a modeling relation - **(b)** and **(d)**. The continuous arrows **(a)** and **(c)** represent the internal entailment procedures in each system, so that, if we have a proposition **P1** in **F1**, the application of the rules of derivation **(a)** would lead us to a new proposition **P2** equally consistent in **F1**. The same for a proposition **S1** in **F2: S2** would be a derived proposition of the application of **(c)** to **S1**. This simple diagram allows us to define what a modeling relation is: if the encoding of P1 into **F2** as **S1**, through **(b)**, followed by the application of **(c)**, producing a proposition **S2**, followed

27 Badiou 2007

by the decoding of **S2** into **F1,** through **(d)** always arrives at the same proposition **P2** that we would obtain by applying **(a)** to **P1** - that is, if the two paths *always commute, for any **P** in **F1***- then we can say that **F2** is a model of **F1.**

Even though this seems a rather simplistic diagram, it already allows us to formulate some important ideas. First, it allows us to consider a formal definition of *prediction*. Say we have no or restricted access to the entailment structure in **F1** - that is, we cannot directly derive **P2** from **P1** solely with the resources provided by our grasp of the initial formalism. The alternative path through **F2 (b-c-d)**, which has shown to be commutable with the path through **(a)**, can then lead us to arrive at **P2** through an alternative route. This definition can be given a temporal interpretation in physics, insofar as we can manage to "run ahead" of a certain mechanical interaction and predict a future state through theoremic proofs within our formalism, but more generally it shows that the modeling relation can provide us with a way to "unpack" inferential structures which, within a certain entailment system, might obscure possible results within that very system. As we said, whole fields of mathematics are based upon the possibility of enriching our comprehension of a given formal region by the derivation of new theorems through the recourse to these heterogeneous "mixes"[28].

But a second thing this diagram shows, and that is highly important for us, is that the encoding and the decoding arrows are not entailed by either **F1** or **F2.** The decision of *how* and *what* to encode from one system to another cannot be internally motivated by any of the related formalisms. It is neither a geometrical nor an algebraic proposition that the solutions to systems of polynomial equations "express" intrinsic properties of geometrical spaces, this modeling relation relies on a certain *creative decision* that is irreducible to the formalisms being mixed together:

"The first matter of importance is to note that, from the standpoint of the formalisms being compared, the encoding and decoding arrows are unentailed. In fact, they belong to neither formalism, and hence cannot be entailed by anything in them. The comparison of two inferential systems, like **F1** and **F2**, thus inherently involves something outside the formalisms, in effect, a creative act, resulting in a new kind of formal object, namely, the modeling relation itself. It involves art."[29].

28 Lautman

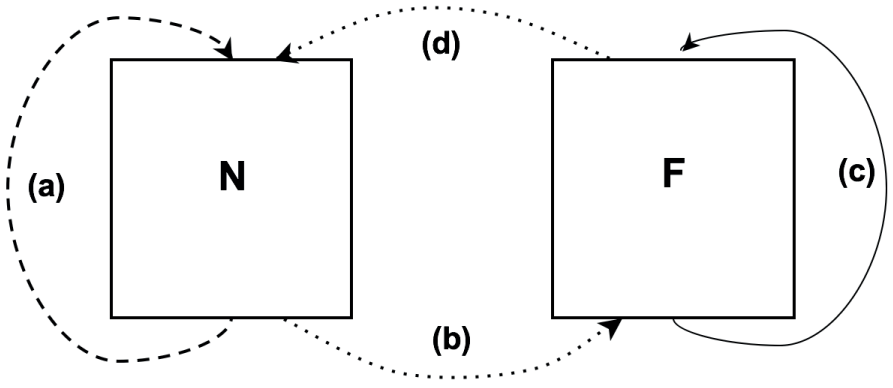
29 Rosen 1999, p. 54

To which Rosen adds:
"The second matter concerns whether this creative act can itself be formalized, i.e. whether the study of comparison of formalisms is itself a formalism. In a nutshell, the answer is *yes, in a sense.* THe name of that formalism is the Theory of Categories; the qualification is that Category theory, like Number theory, liek Set theory or like natural languages themselves, cannot be formalized (...) Indeed, many mathematicians have wondered aloud, over the years, whether Category Theory is even a part of mathematics. However, Category Theory comprises in fact the general theory of formal modeling"[30].

With this, Rosen helps us to locate the immanent point of passage between Jameson's aesthetic concern with the art of mapping between structure and phenomenological experience to Alain Badiou's approach to the problem through category theory - a theory which was born from the concern with turning the "creative act" of mapping and comparing formalisms into a formal object in its own right. The capacity of Category Theory to treat the comparisons between formalisms as formal objects themselves allows Rosen to propose a more rigorous critique of the underlying issue which, for him, prevents the advancement of theoretical biology: the identification of scientific modeling and mechanistic formalisms. This is not our focus of interest here, but it is worth considering the difference between comparing formal systems amongst themselves and comparing natural and formal systems, as this shift in perspective invisibilizes the formal theory of encodings and decodings at the same time as it brings forward the problem of experimentation.

The formalization of the mapping between systems is what interests Rosen in category theory, as we mentioned, and the reason for this is that, when we approach the problem of modeling directly within the context of natural sciences - which implies dealing not with two heterogenous *formal* entailment structures, but with the relation between *formal* and *causal* entailment - we lose the formal status of the modeling mappings, and therefore the possibility of rationally assessing *how* we chose to encode this or that aspect of nature into our models.

30 Ibid., p.54



Assuming there is such a thing as a "natural law"[31], without which science would be meaningless, this schema depicts a natural system **N** and a formal one **F**, with their respective - and now ontologically distinct - entailment structures (**a**) and **(c)**. The question, for natural science, is then how to encode data from **N** into **F** - through an encoding relation **(b)** - so that the derivation of propositions within **F**, through its own entailment rules **(c)** might later be decoded through (**d)** into new - and verifiable - information about the natural system **N,** that is, the question of how to predict something about **N** through **F**. Given that we do not have access to the causal laws themselves **(a)**, if we manage to encode data from **N** through **(b)**, derive new propositions through **(c)** and then verify, through **(d)** that these formal results correspond in some way to the new situation of **N**, as if we had just let causality "work by itself", then we can say that system **F** is a model of the natural system **N**.

Here, as in the case of the comparison of two formal systems, arrows **(b)** and **(c)** are unentailed by the systems they connect, but also, unlike the previous situation, given the need to compare causal and formal entailments, these modeling relations cannot even be treated as formal objects in their own rights, since mappings are only conceptually rigorous objects when we are dealing with the mapping between regions of mathematics[32]. On the other hand, this essential heterogeneity of natural science is also what endows these two arrows with very special determinations: for example, a crucial problem of encoding becomes the issue of *measurement* - of making N and F "co-mensurate" - which

31 "Natural law makes two separate assertions about the self and its ambience: 1. The succession of events or phenomena that we perceive in the ambience is not entirely arbitrary or whimsical; there are relations (causal relations) manifest in the world of phenomena; 2. The relations between phenomena that we have just posited are, at least in part, capable of being perceived and grasped by the human mind" (58)

32 Badiou 2007

in classical mechanics might concern the association of a *number* in **F** to an *event* or phenomenon in **N**. The problem of experimentation therefore enters the picture at the very point where mappings are no longer guaranteed by the underlying homogeneity between what is being mapped.

A future instalment of this research will require us to engage in more detail with Rosen's "relational biology" as it provides us with a novel approach to the concept of organization which bypasses complex systems theory - which he understands as a more "ptolemaic" theory of organization - and opens a new way to think about experimentation with and within organized systems. But it suffices to mention here that it is through category theory that Rosen comes to a pure concept of organization, totally separated from the particulars of its material realization but nonetheless rich in intrinsic determinations, with its own entailment structures and an alternative "grammar" to that of the physics of the inorganic and its underlying reliance on the concept of "state"[33] - in other words, Rosen *constructs the concept of organization out of a theory of mappings*, further imbricating these two threads which we have been trying to force together throughout this study. This is an essential result for us - and a crucial aspect of Badiou's project, which we will also discuss in our next contribution - for one very specific reason: if we were to accept that the formalism which can capture the relevant properties of organizations - their degrees of order, the relations between its components, the logical space constituted by its topology, etc - is the same formalism that could respond to the challenges faced by the theory of cognitive mapping, we might be ready to suggest that *collective organizations also have the aesthetic function of registering information about social spaces.*

33 Rosen 1999.

Bibliography

Althusser, Louis 2001, "Ideology and Ideological State Apparatuses", in *Lenin and Philosophy and Other Essays*, London: Monthly Review Press

Badiou, Alain 2006, *Logics of Worlds*, London: Continuuum

---------- 2007, *The Concept of Model*, Melbourne: Re.press

---------- 2019, "The Idea of Communism", in *The Idea of Communism*, Žižek, Slavoj & Douzinas Costas (eds), London: Verso

Dupuy, Jean Pierre 1989, *The Autonomy of Social Reality*, World Features, Vol 27, Issue 2-4

---------- 2009, *On the Origins of Cognitive Science: The Mechanization of the Mind*, Massachusetts: MIT Press

Jameson, Fredric 1992, *Geopolitical aesthetic: Cinema and Space in the World System*, Indiana: Indiana University Press

---------- 2016, *Badiou and the French Tradition*, New Left Review 102

Lynch, Kevin, 1960, *The Image of the City*, Massachusetts: MIT Press

Marx, Karl 1992 *Capital, vol I*, London: Penguin

Nelson, Cary & Grossberg, Lawrence 1998, *Marxism and the Interpretation of Culture*, Illinois: Illinois University Press

Hayek, Friedrich, 1973, *Law, Legislation and LIberty*, vol 1, Chicago: University of Chicago Press

---------- 1945, *The Use of Knowledge in Society*, available at: http://www.econlib.org/library/Essays/hykKnw1.html

Oliveira, Rafael 2015, *Comunismo: emancipação abstrata*, available at: *https://www.ifch.unicamp.br/formulario_cemarx/selecao/2015/trabalhos2015/Rafael%20Oliveira.pdf*

Rabinbach, Anson (1990) *The Human Motor:* Energy, Fatigue, and the Origins of Modernity, Berkeley/Los Angelos: University of California Press

Rosen, Robert 1990, *Life Itself*, New York: Columbia University Press

---------- 1992, *Essays on Life Itself*, New York: Columbia University Press

Sohn-Rethel, Alfred 1978, *Intellectual And Manual Labor: A Critique of Epistemology*, New Jersey: Humanities Press

Toscano, Alberto & Kinkle, Jeff 2015, *Cartographies of the Absolute*, London: Zero Books

Tupinambá, Gabriel 2014, *What is a Party a Part of?*, Crisis and Critique, Vol. 1, Issue 1

---------- 2014 *Real Abstraction and the Autonomization of* Crisis and Critique, Vol. 1, Issue 2

---------- 2016, *Transferential Materialism: Toward a Theory of Formal Otherness*, Slavoj Žižek and Dialectical Materialism, Hamza, Agon & Ruda, Frank (eds), Baskinstone: Palgrave Macmillan

---------- 2016, *Freeing Thought From Thinkers: A Case Study*, Continental Thought & Theory, Vol.1, Issue 1

---------- 2017, *Organization and Political Invention*, Continental Thought & Theory, Vol.1, Issue 4

---------- 2017, *A força social da graça, ou como se avalia o poder popular?* -- available here: https://blogdaboitempo.com.br/2017/07/26/a-forca-social-da-graca-ou-como-se-avalia-o-poder-popular/*Wolfram, Stephen*, Wolfram 2002, *A New Kind of Science*, Ilinois: Wolfram Media, Inc.

Yao, Yuan, 2018, *From Cognitive Mapping to Sheaves*, Crisis and Critique vol. 5. Issue 2

Žižek, Slavoj 2004, *Parallax View*, Massachusetts: Mitss Press

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From Cognitive Mappings to Sheaves

Yuan Yao

Abstract: The grand Marxist science of history is today relegated to a more modest call to render visible the rapidly growing economic complexity around us. This text argues that a combination of data science and topology might provide tools to track this complexity and give us a new, scientific reading of Marx's theory. We propose a novel interpretation of value as a space, and the market as a process of "sheafification". We show how this approach provides an intuitive framework for a "data-driven" approach to the critique of political-economy.

Keywords: Marx, Jameson, Dupuy, Space, Data, Topology, Sheaf, Market

Marxism as a "cognitive mapping"

The phrase "cognitive mapping"[1] has served in recent decades as a call to work for cultural theorists and philosophers. It signifies something we lack today: a way to track the determining role of economic abstractions in everyday life. Though we are reminded constantly of what happens on the market, these events remain blurry and at a distance such that we only ever see vague patterns in them. Information becomes indecipherable in a political sense even as our access to it grows. Proportional to the deluge of information is our reliance on experts to interpret what the market wants from us. However, these interpretations inevitably fall short. It is true that one can *describe* the global economy from data which is readily available[2], and such descriptions may yield valuable predictions. However, because they are restricted to the world of commodities, these descriptions together offer only a *flattened* image of capitalism.

Marx, on the other hand, proposes that any faithful model of capitalism must explain its inherent tendency towards crisis. He also predicted that such crises would necessarily lead to a complete rewrite of the social order. Regardless of whether his prediction comes true, Marx's effort to systematically think not simply phenomena *within* capitalism (price fluctuations, growth, unemployment, etc.), but also the historical ruptures which precede and succeed it, remains compelling. By constructing a model larger than that of a single economic system, in which capitalism can be viewed as just one moment, Marx opened a hole in political-historical thought.

Today, critiques of the excess of capitalism are by no means

1 First coined by Lynch 1960 it was then borrowed by Jameson 1992, then Slavoj Zizek and others. For a good history of the term, see Toscano and Kinkle 2014

2 For example https://atlas.media.mit.edu/en/ or https://data.oecd.org/api/

exclusively Marxist[3]. As bourgeois economists attempt to grasp the systemic contradictions of wealth inequality, their explanations may begin to resemble Marx's, though always careful to not overstep ideological boundaries. Within Marxism itself there are still internal debates around the interpretation and application of Marx's arguments[4]. Thus we find a zone of indistinction between non-Marxists who sound like Marx and those Marxists who are not Marxist enough. Although this may appear as the result of an empty "academic" exercise, it is actually a necessary moment in freeing ourselves from old prejudices. Our lack of cognitive mapping constitutes the ground of an ideological struggle over the "means of interpretation" of economic facts. From the bourgeois standpoint, this struggle involves delimiting the natural order of economic relations and thereby isolating unnatural distortions of these relations. From the Marxist standpoint, it is the de-naturalization and politicization of the economy. However, new positions are appearing which are difficult to classify as either stance, and this perhaps is where new means of interpretation can be found.

In its ideological battle, Marxism has (ironically) ceded ground in terms of scientific tools. This can be understood as part of its adherence to a framework: for many Marxists, the information produced in economic activity is *noise*, and therefore the goal is to filter it out and look only for trends which confirm Marx's theory. To describe the market independent of this effort (i.e. scientifically) is counterproductive, not least because a formal economic treatment is inaccessible to a wide audience, but mainly because scientific formalism generally treats objects as ahistorical. Because of this, we hastily conclude that Marxism's "cognitive mapping" is incompatible with a scientific approach towards the economy. It is true that *only* Marxism offers an account wherein the economy is *produced* by politics and political struggles. Yet it often conflates this truth with a mastery of science itself, an attitude both dogmatic and identitarian.

The Marxist model of history, although it still aspires to be scientific, reduces its object to that of classical mechanics, wherein movement is unaffected by measurement. This leads to the following impredicative paradox: if we suppose "communism" to mean a social form constructed through acknowledging the law of value and class struggle, then this form should be at least as complex and unpredictable as the forms it replaces - otherwise, it could not *include* these previous forms. If so, how do we reconcile this requirement of complexity with Marxism's

3 Some popular accounts are Reich 2015 and Piketty 2014

4 See, for example, the debate raised by Heinrich 2013 and some notable responses from Kliman, Freeman, Potts, Gusev, and Cooney 2013, and Carchedi, Roberts 2013

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teleology and voluntarism? Marx's narrative of the dictatorship of the proletariat collapses, not due to its empirical failures insofar as these can be explained by a Ptolemaic revision, but because of its recursive nature. As long as the proletariat depends on crisis to assert itself, it will also depend on the social forms which produce crisis. Any *emergent* version of communism therefore implicitly takes the market as the paradigm for self-referential complexity in social organization[5]. In short, the old Austrian-school critique of planning remains unanswered, namely, that one cannot have dynamic growth without the price system. This is attested by the fact that as soon as we envision society *without* the market, Marx's theory becomes inconsistent.

The outcome is that Marxists today do not usually spend time formulating ways of running a global economy[6]. When we advance to concrete proposals we find sectarian splits over questions such as the role of money, party, and state. This is not necessarily a critique but an observation valid for anyone who attempts to move from critiques to construction. To be fair, modern (neoclassical) economics has not even reached the conclusion that capitalism should be reshaped, preferring to turn a blind eye to the regularity and intensification of crises. Marx's analysis still holds the advantage here because it already counts overproduction, unemployment, class divisions, and ecological degradation as internal to our economy[7], whereas these are only "externalities" to bourgeois economists. The approach of this text is the same - we take capital to be a complex, inherently "contradictory" form that does not necessarily converge to a state beneficial to humans.

Given the events of the 20th century, it seems the dual goals of scientifically analyzing history and planning the economy inevitably lead to trusting in reductive models. But perhaps this is only a consequence of the scientific illiteracy that Marxism has resigned itself to? Today, the fields of computational data science and machine learning offer methods to construct models of social phenomena whose complexity threshold are much higher than we can imagine. These fields begin with a space larger than our individual perspectives, the multidimensional

5 In other words, society belongs to the class of phenomena whose laws do not allow for an immediate prediction of a future state - rather, we can only simulate *parts* of its future state.

6 Those that do so cease to appear Marxist at all. For example, "socialism with Chinese characteristics" or "capitalism with Asian values" shows how Marxist pragmatism becomes a market pragmatism without much need for Marx any longer. So we either have a clear view of historical transformation without grasping market complexity, or we have a concrete way of controlling the market via authoritarian power but no recognizable vision for transformation.

7 Recall Zizek's four horsemen: ecological destruction, apartheid, unchecked biogenetic technologies and the indetermination of intellectual property. Also see Saito 2016 for an ecological reading of Marx's notebooks.

space of data itself. From this space we can computationally grasp otherwise invisible social phenomena. Perhaps this is not only a tool for inventively extracting surplus value, but also the means of realizing the dream of Marx, a "new kind of science" of history. What if certain datasets articulate spaces *between* the lifeworld of individuals and the totality of capitalist relations? This domain would be historical but not psychological, concrete yet amenable to formal methods, and thus a site for political intervention.

Data itself is meaningless without a set of metrics that can "project" it into some space[8]. These metrics likewise depend on a process of choosing the right questions to ask, questions which determine the kind of meaningful answers one can receive[9]. We should combine this with the fact that the value abstraction is not a natural phenomena but contingent and political. One could therefore speculatively define today's alternate forms of organization as those which can produce new *questions* and generate new, decisive *models*. We propose then that the project of re-constructing a cognitive mapping amounts to a data-science department within Marxism.

Data and Space

The central question of the "science of history" could be posed as: what determines changes to the form of organized human activity? One can observe different "scales" to this question, each corresponding to a different science and scientific object. However, it is difficult to determine the relative ordering of these scales. Perhaps human activity depends on psychology. Perhaps it depends on international and domestic policies, conflicts, etc. that eventually manifest in individual lives. Or perhaps it is driven by cultural productions and ideological apparatuses. The scale we choose determines our approach to the question, and when we translate data from one scale to another we lose causal information. For example, individual psychology can appear as either the driving force or the effect of other forces depending on our starting point.

If we take this indeterminism-between-scales as a general rule, we find ourselves unable to adhere to the simplistic "base-superstructure" model of society[10]. Instead, we should reframe the question in terms of

8 In terms of linear algebra, we need to select certain *basis* vectors to form a linear space.

9 We can locate the excitement around Piketty 2014 as evidence of the position that data (as well as a proper question) makes a material difference.

10 A model which Kojin Karatani classifies as part of the architectonic impulse in Western thought. See Karatani, 1995

space and transformations between different spaces. In this view, the points of each space are its data, and the difference between points is only visible within that space (or spaces which are equivalent to it). When we transform one space to another, we lose information (differences between points). Therefore, when we attempt to interpret data, we must always ask ourselves which space we are working in, and the tradeoffs we incur when moving between spaces. Every (non-trivial) dataset has an infinite number of possible spaces it can be projected into. For a subject matter as manifold as history, there is no primary space, only those spaces appropriate for modeling causality for a given data set.

Therefore, this text will not directly explore techniques for studying data, but rather attempt to augment our intuition of space[11]. This will allow us to later develop a notion of the "shape", or **topological** properties, of data[12]. Perhaps this will enable a view of the determinations of the value-form in a new, non-reductive manner. To begin, **Euclidean** space in two dimensions can be characterized by the famous formula:

$$a^2 + b^2 = c^2$$

which is the relationship of the sides of a right-angled triangle to its hypotenuse, a fact known as the Pythagorean theorem. If we are given an origin point and a pair of real-number axes[13], called x and y, we get the standard Cartesian plane[14].

11 I have highlighted certain terms to make it easy for the reader to shore up any gaps in technical knowledge.

12 The "shape" of data is the object under scrutiny in the nascent field of Topological Data Analysis (TDA). TDA builds on the notion of "persistent homology" to extract information from data in a way that is resistant to noise. The present text does not aim to provide sufficient background for TDA. However, a good starting point is Curry 2017.

13 When both $a, b = 1$, c will be an irrational number - numbers which cannot be represented as fractions - so we must use the real numbers (which include irrationals).

14 Euclidean space has an inherent notion of distance. The Cartesian plane is just the Euclidean plane with a system of coordinates. In the latter case, we can do something extraordinary. If we hold c constant, and allow the coordinates of the sides to vary, we produce the equation of a circle. This gives rise to the notion of "algebraic curves", equations whose solutions (values which make the equation equal zero) describe shapes in space.

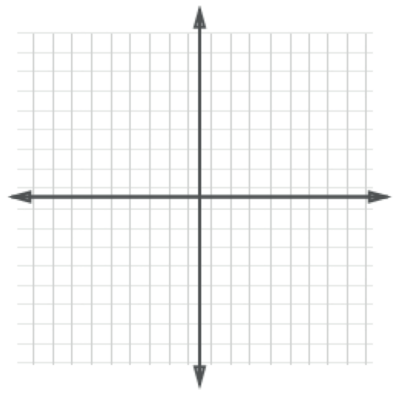

Fig. 1 *Cartesian Plane*

Any point on this plane can be interpreted as the **vertex** of a right angled triangle, where its distance to the origin is the value of the hypotenuse *c*. Likewise the distance between any two points in this plane is the hypotenuse of another right-angled triangle[15]. We can conceive "distance" here to be a very basic type of data, and the Pythagorean formula as a way to transform this data into new information. For example, we can now ask a very common data question: given a set of points and a single point in that set, what are the nearest neighbors of that single point?

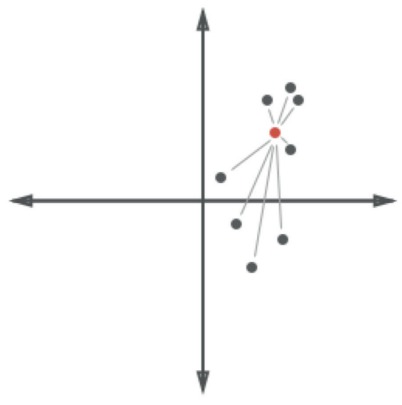

Fig. 2 *The nearest neighbors problem*

The data theoretic perspective then consists of tracking this

15 We recover the Euclidean distance formula proper just by replacing the variables on the left in the Pythagorean theorem with distances between Cartesian components. So $a = x_1 - x_0$, $b = y_1 - y_0$, and so on.

information over time as the distribution of points changes. We call any space in which we can compute distances between points, such as the one just described, a **metric space**. We can produce other metric spaces by changing the formula of Pythagoras to something else, provided that certain conditions hold.[16] We can also vary the dimensions of our space[17].

An important step in enriching the idea of space is to study **transformations** of one space to another. A practical example can be found in Galileo's studies of motion. For Galileo (and Newton), uniform motion and rest are indistinguishable as frames of reference for expressing physical laws. This principle can be expressed as transformations of one **reference frame** to another, taking distance travelled to be invariant. If particle *A* moves 5 meters away from particle *B* at some **velocity**, it is physically equivalent to say that particle *B* has moved 5 meters away from particle *A* at a symmetric velocity[18]. Another more geometric description is to say that the distance between *A* and *B* form the hypotenuse of a triangle which has the same lengths and angles in any reference frame at a given moment. One could therefore imagine various frames (at a given moment) as rotations of one another, and Galileo's principle as a type of **symmetry**[19] insofar as it preserves the Pythagorean relation.

16 More formally, a function is a metric if it is symmetric, positive-valued, and satisfies the triangle inequality. Another example: the metric a + b = c describes a space resembling the rectilinear streets of Manhattan. In three dimensions, it describes a space where points are distributed along a cubic lattice.

17 In the Euclidean context, we can simply add or remove squared terms to the left side of the equation (e.g. $a^2 + b^2 + c^2 = d^2$ in 3 dimensions where d is now the length of the hypotenuse).

18 The velocities are not the same, since we are moving in opposite directions relative to one another. However, the magnitude of the velocities are equivalent.

19 This formalism is called *linear algebra* and rotational symmetries belong to the theory of *groups*.

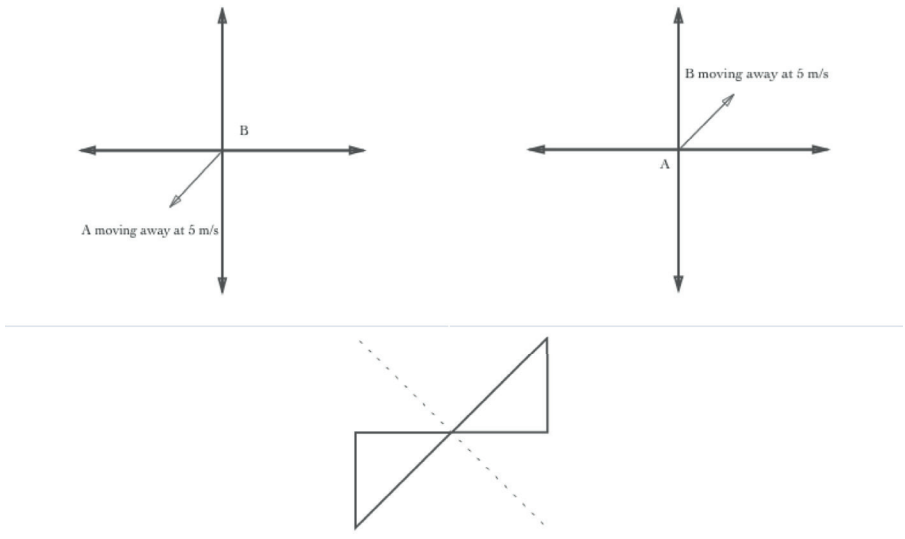

Fig. 3 *Galilean transformation of the coordinates of one space to another, preserving relative distance*

A famous theorem by Noether asserts that the symmetries of a physical system correspond to a quantity which must be conserved in transformations of that system. In the above, we preserved relative distance between different reference frames, but there are symmetries corresponding to energy, momentum, particle "spin", and so on. **Field theory** tracks these quantities at every point in a space and describes ways of transforming them along with the spaces themselves. We can view this as a continuation of the theme of conjoining data with space.

Now, to incorporate time, we can introduce a new parameter *t* into our Euclidean metric. We can define it as:

$$t^2 + x^2 + y^2 + z^2 = s^2$$

This is the formula for 4-dimensional Euclidean space where time is just another spatial dimension. Yet, Galilean symmetry does not apply to the time dimension as the latter is unidirectional. One can get around the difficulty again by considering a transformation from space to time which would enforce this unidirectional property. In other words, we want to associate to every point in space a time, and to require that transformations of spaces preserve this quantity. Yet, we may also want to view the evolution of a particle system through time, so it is useful to

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consider a transformation of moments of time back into a given space. To achieve both, we can start by visualizing "snapshots" of a 3-dimensional space () at each tick of a virtual clock, and arranging these snapshots as successive "slices" along a real number line, called the timeline (). Doing this, we obtain the following picture:

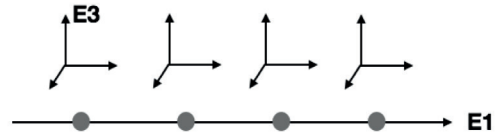

Fig. 4 *The "trivial" line bundle $E^1 \times E^3$*

This construction is an example of a **bundle**, where each snapshot of (Euclidean 3 dimensional space) is a **fiber** "indexed" by a **base space** (the 1 dimensional timeline). Given a particle and some distinguished origin point, we can view a trajectory at each moment in time. By Galilean symmetry, we can also choose an infinite number of reference frames for this trajectory, including one where the particle remains still. However, a reference frame cannot include any information about the particle's future or past state. Time is universal under Galilean transformations because they act on a given fiber but not along the base (time). We can picture uniform motion in this setup as a straight line intersecting with each snapshot at a single point. Non-uniform (accelerating) motion is described by curved lines. Such (straight or curved) lines can be pictured as "embeddings" of the timeline itself in the bundle space. In this view, we are "lifting" the timeline into a larger space, giving it more degrees of freedom. Since there could be many such liftings, each one is aptly called a **cross-section**, to indicate that they cross each fiber at a single point for every point in the base[20].

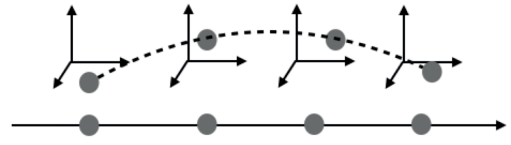

Fig. 5 *Cross-section of the bundle corresponding to non-uniform motion*

20 Another example of a bundle is given by the act of watching a TV show. We are able to rewind, fast forward and jump to various points in the show using the timeline controls on our computer, or a remote control. This implies that our fibers are 2-dimensional pictures on the screen indexed again by a 1-dimensional space. The movement of an object across the screen corresponds to a cross-section. For a gentle introduction to this, see Lawvere, Schanuel 2009, pp. 91-98. For a physics-motivated introduction, see Penrose, 2004, pp. 325-356.

Again, to take a data-theoretic view, we can associate to every point in the base (the timeline) its possible cross sections, without necessarily representing the fibers themselves. Such a perspective may illuminate why this construction is called a bundle:

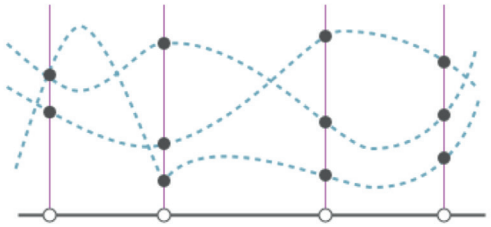

Fig. 6 *A line bundle with "stalks" growing from the bottom, "germs" intersecting with cross-sections*

A question we can now ask is, for a given subset of our base space, what are the cross-sections which preserve certain properties, such as continuity? In the physics of motion prior to Einstein, the **set** of cross-sections was conceptually larger, since there was no known universal bound on the velocity of objects. Therefore, a particle in space at one moment in time could be anywhere else in the next moment, provided it had enough speed. This changes with Einstein, specifically with the advent of the Minkowski metric derived from relativity theory, which can be written as:

$$-c^2t^2 + x^2 + y^2 + z^2 = s^2$$

where *x, y, z* are the usual Euclidean distances, *c* the speed of light, *t* the elapse of time, and *s* the spacetime interval between two events. Notice that the interpretation of points has now changed from being purely spatial to one involving a particular constraint on time. For example, setting *c = 1* and *x, y, z = 0* we obtain the equation for a cone[21] along the time axis (now modeled as a complex axis): *s = t * sqrt(-1)*, and conversely, setting *t = 0* we obtain the Euclidean metric again. This cone is a restriction on not only possible movements of a particle at the origin, but also of any information whatsoever.

One could imagine the values of *x, y, z* and *t* being recorded by satellites orbiting Earth. Special relativity suggests that the relative motion between satellites will cause their respective clocks to drift

21 Technically, a hypercone, since it is expressed in four dimensions.

apart. In order to account for this difference, one exploits symmetries in Minkowski spacetime, just as we did in Euclidean space. This amounts to applying transformations which preserve the spacetime interval *s*, the so-called Lorentz transformations.

Formulating the above in terms of bundles, there is a restriction in the possible cross sections of the bundle due to the fact that nothing can travel faster than light, and that light-speed is constant in all reference frames[22]. This restriction can be expressed by the way in which fibers must be "held together" when we generalize our base space to **manifolds** instead of simple Euclidean spaces. Einstein's general theory of relativity formulates spacetime as inherently curved by energy. The notion of straight lines is replaced by more general **geodesics**, paths which describe this curvature over some set of connected fibers[23].

Traditionally, the problem of connecting fibers arises in the problem of **parallel transport**, that of moving a vector along a surface such that it remains parallel at all times.

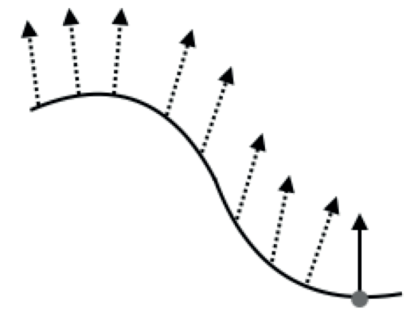

Fig. 7 *Parallel transport of a vector along a curve*

We can augment our intuition by asking ourselves why such a problem is important[24]. If we imagine placing ourselves within a single Euclidean fiber, we should notice that there is no question of the definition of parallel. It is only when tracking changes of points within a

22 Just as Galilean transformations preserve the Pythagorean theorem in all reference frames, the Lorentz transformations preserve the form $x^2 + y^2 + z^2 - t^2$ for any (x, y, z, t).

23 Among other things, this explains why massless particles are influenced by gravity (which Newton's theory could not explain).

24 In physics, this problem leads to the central notion of "gauge" invariance, which concerns preserving a different quantity (field strength) under different particle configurations. An early example of this is the relation between electric and magnetic fields formulated by Maxwell.

succession of fibers (along some subset of the base) that we can observe geodesic motion. A relativistic framework that captures this kind of motion should ideally be able to transform back to the local Euclidean case, when the curvature of space by gravity is negligible. Yet it should also express global features. Earlier we introduced the notion of spaces and transformations between spaces - now we must consider how to characterize "higher-order" features of a system of spaces. For example, how can we distinguish between the following bundles?

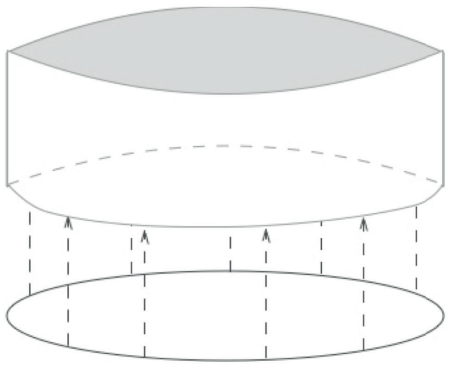

Fig. 8a *A trivial circle bundle $S^1 \times E^2$*

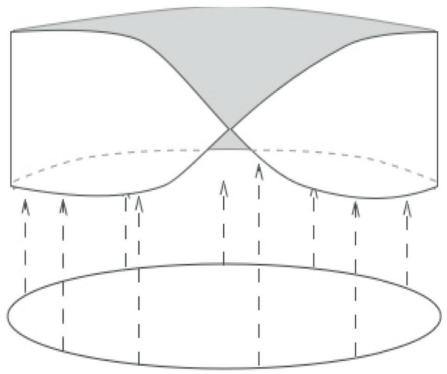

Fig. 8b *A non-trivial bundle over S^1*

Figure 8b depicts fibers that are arranged as slices of a **Mobius band**. This satisfies our definition of a bundle since every point in S^1 (a circle) below has a corresponding E^2 fiber above. Yet when we consider the parallel transport problem, there is an obvious issue: any vector in the bundle moved along the circle will change directions by the time it has reached its starting point again. This feature is invisible at the level of an individual fiber. Moreover, it may be invisible even if we examine most of the fibers together. Only if we take a global view of this space can we verify this property.

Ideology and restrictions to the local case

The concepts described above come from mathematics and physics. Why bring them up in a text which opens on questions of Marxism and political organization? Our position is that the crisis of cognitive mapping discussed in the introduction pertains to a poverty in our intuition of space. When we consider our economic system as a global phenomena, it is tempting to think of the base space as the surface of our planet.

By assuming this, we already cast problems in terms of geography and physical distance. Yet, it is clear that today, a migrant worker in one country has more in common with one across the world than he does with his neighbors. Those of us with internet access live in a different world than those without. The link between exploitation (and more generally, immiseration) and surplus value seems non-existent when markets can emerge and disappear in an instant, registering only for a moment on computer screens. At the same time, economists and politicians use the same geo-political rhetoric as before, attempting to map incompatible phenomena into the common space of the visible. Here, ideology is a matter of producing false, or reductive, *localizations* of more general phenomena.

To address this, we are attempting to develop an intuition which will aid us in absorbing and modeling data in new, meaningful ways[25]. However, this requires both an education in new formalisms and the critical step of questioning our assumptions. Our current systems of representation are highly susceptible to reducing phenomena to an individual level. This is why modern economics, for example, is built up from several tenuous assumptions about human beings and their self-interest. These assumptions amount to an unspoken metaphysics[26], where price signals are supposedly reflections of aggregated *individual utility*. This serves an ideological purpose: it justifies market activity as the "will of the people" and therefore sacred. Following this line of thinking to the end, if we attempt to constrain the market, we distort its inherently democratic power (where our money counts as our vote), ultimately curtailing individual freedom.

Yet, another viewpoint is that prices are outcomes of a game of specular reasoning and are not determined by utility at all. Under this (Marxist) critical stance, the drive for profit is what sustains the system of prices, including the price of labor which, as labor becomes commoditized, makes a mockery of individual freedom. In both there is a tendency to reduce economic complexity to an issue of individual psychology. For the former, it is a matter of rational self-interest, and in the latter, of class consciousness. However, what our discussion on space entails is that the setting proper for studying this complexity is not individual, but formal.

25 Such a project would obviously require far more than this brief expository text. One would need to gather, at the very least, a working knowledge of topology, statistics, economics and computer science. But we intend to demonstrate that these various fields *could* be combined in novel and interesting ways to aid in political action.

26 This is brilliantly argued in Dupuy 2014

Any political project must construct tools adequate to the phenomena it is attempting to change[27]. In the case of the market, it is clear that the tools must be transnational and at least partially computational. The 2008 crisis was worldwide, and aside from growing distrust of financial capitalists, it has not yielded a proper mechanism for preventing future events. From a game theoretic perspective, if only a subset of nations regulate the market, then remaining nations have more incentive to deregulate. This situation changes only when global externalities are counted in the price of deregulation for an individual agent. A way of viewing these externalities in terms of *intrinsic properties* of a space is a tool the Left must construct.

This is also why it is useful to study modern mathematics, which can be considered a science of equivalences. The term mapping, for example, can be generalized by considering the importance of maps, or **morphisms**, in category theory[28]. In the categoric perspective, all mathematical properties can be characterized by morphisms which transform mathematical objects to other mathematical objects. In most cases, information is lost in the process, and the transformation is one-way. In key cases, however, morphisms are **invertible**. We can find examples in plain functions of numbers, sets, or spaces, but also in proofs which transform one mathematical statement to another. This means that mathematical activity itself produces transformations (of the existing body of statements to new statements) in a sense fully compatible with its own formalism. The basic operation is **composition**, which is the act of producing new morphisms from old ones. Two mathematical objects which are not equivalent (or rather, **isomorphic**) can nevertheless share information via chains of composed morphisms between them.

The scientific procedure generally consists of going in the reverse, which is to say, decomposing morphisms (e.g. physical phenomena) into their factors. This is what we're going to investigate now in the context of space and data. Namely, given a set of points, can we detect their underlying shape? Also, can our methods work regardless of which metric we choose for our space?

27 This principle is formulated thoroughly in Tupinamba, 2014.

28 The rules of category theory of simple, but the game itself is enormous in scope. To form a category one needs **objects** and **morphisms**, where morphisms are defined as having objects as their domain and codomain (source and destination). There is only one operation required to start: composition of morphisms, which produces a new morphism from two or more other ones. This operation is subjected to the rule of associativity (combining morphisms f, g, h is the same as combining f and g first, then h, which is the same as combining g and h first, then f). Finally, every object has at least its identity morphism, which is a morphism going from the object back to it. The game itself consists of finding which categories are equivalent.

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Sheaves

We have seen how the structure of a bundle can be described by taking cross-sections of it. These cross-sections can describe global features not necessarily visible in local regions of the bundle space. We might then become interested in obtaining the cross sections required to reconstruct certain features of their underlying space. Or we might be interested in spaces which may look the same locally but have different global structures. This begins to sound like problems of data-science and computational learning where one wants to approximate a certain *structure* using data and then use that structure to make predictions. Along these lines, we propose to extend the metaphor of cognitive mapping with another one, that of the mathematical **sheaf**[29][30].

Intuitively, a sheaf is a consistent assignment of data to space. Everything lies in this notion of consistency - it tells us why certain assignments will work and others will not. First, we need to generalize the definition of space from the metric and bundle description above[31]. Let us define a topological space as **open**, that is, as a collection of points which do not contain their collective boundary. If we choose any point in an open region, we are able to form a ball, centered on this point, which is fully contained in the space. Alternately, we can say that any point in an open region can be moved by some arbitrary distance and still remain within that region[32]. This property allows us to forego an explicit metric for distances. Let us call **continuous** any function (assigning points in one space to another) which maintains this quality. That is, given an assignment of point *A* to point *B*, if *B* belongs to an open region then the same holds for *A*. A stronger condition is to require that any point *A* can be recovered from *B*, and vice versa. Any such continuous function is called a **homeomorphism**. For example, we can assign

29 Sheaves were invented by the French mathematician Jean Leray while he was interned at a POW camp during the second World War. They were subsequently used by Alexander Grothendieck to axiomatize "homological algebra", a branch of algebraic topology. In an important paper from 1957, Grothendieck establishes that the category of sheaves of abelian groups is the "appropriate setting" for algebraic topology. The notion of a "topos", also essential to modern mathematics, is a generalization of this work. For a good history, see Mclarty 2003.

30 The author is by no means an expert on this topic. However, the aim is to evoke interest in the sheaf and its related notions. That being said, the main reference is Mac Lane and Moerdijk 1992.

31 The "ladder of abstraction" for the notion of space is one of the longest in mathematics. In the following examples we use a basic definition of topological space, that is, a set of points with open subsets obeying certain axioms. Alexandre Grothendieck demonstrated that one could replace these points with objects in a category and still maintain the sheaf conditions.

32 Given this notion of openness, the following axioms must hold for topological spaces:
1. The (finite) intersection of open regions must be open.
2. The union of two or more open regions must be open.
3. The entire space is open and so is its empty space.

points of a (hollow) circle to a closed disk, but when we attempt to do the reverse, points close together inside the disk will be "torn" from one another. On the other hand, assigning points of a circle to a square is invertible - therefore these spaces are **homeomorphic**. Topology deals with classifying spaces in terms of properties which are independent of metrics. One such property is that of **homology** which, roughly speaking, measures how many n-dimensional holes are in a space. A closely related property is that of **homotopy**, which classifies spaces as equivalent if they can be continuously deformed from one to the other[33].

Immanuel Kant defined "synthesis" as the process of unifying multiple, disparate representations under a single concept[34]. Computational data science aims at a similar goal. In the field of machine vision, for example, the primary task is to train a computer to recognize objects from images. There can be an infinite number of representations of the same object, so this task can be quite formidable. "Deep learning" is a technique for extracting multiple levels, or layers, of a given representation. Concepts such as shape, color, texture, etc. can be derived dynamically insofar as each contribute to the goal of classification. By computing a score for a particular image (with respect to these features) such a deep learning network can determine that an image is a representation of a particular object. This requires "training" the network on test representations, giving it a sense of the factors needed to transform an image into its classification. Clearly, the space of representations is open in the sense defined above, since the computer must be able to correctly classify images it has never seen before. In other words, the deep learning network constructs intermediate spaces from representations and the classification space (a yes or no in many cases). At the heart of such techniques is the spatial abstraction of data.

If we add arrows between open regions of a space whenever one region is contained in another, terminating with the entire space and starting with the empty region, we get something akin to the following[35]:

33 A good introduction available online is Hatcher 2010.

34 Here is an interesting intersection with modern artificial intelligence, since for Kant there is no synthesis which is not immediately conscious. For example: "This thoroughgoing identity of the apperception of a manifold which is given in intuition contains a synthesis of representations, and is possible only through the consciousness of this synthesis." from Kant 1998, p. 247

35 A lattice is formally defined as a partially ordered set where any two elements have a *join* and a *meet*, that is, a common "parent" and "descendent" respectively.

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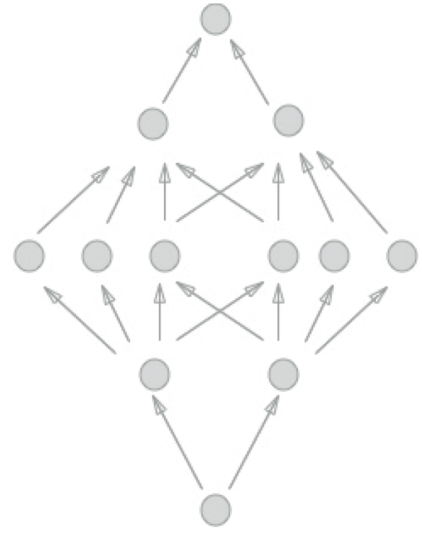

Fig. 9 *A topology depicted as a lattice*

If we simply replace "contains" with "is greater than", then this is an order relation. However, sometimes two regions are neither greater than nor less than each other (i.e. are siblings). This is therefore a **partial ordering**. This ordering is another type of data similar to distance. Just as we can classify transformations of points of a space by how much information (differences between points) is lost (cannot be recovered by an inverse transformation), we can split transformations which preserve open regions and their relative ordering from those that don't. In fact, given an adequately rigorous idea of "open regions", one doesn't need to refer to points at all.

A **presheaf** assigns open regions of a space to data such that subsets of data correspond to subregions. Going from a region to a sub-region produces a **restriction** on the associated data. One can imagine two "screens", one containing a space and another some information. One is allowed two actions: to "select" an area of the space and to "shrink" the current selection. When we select different regions, we see a corresponding change of information on the other screen. When we shrink our selection, we see the information shrink respectively.

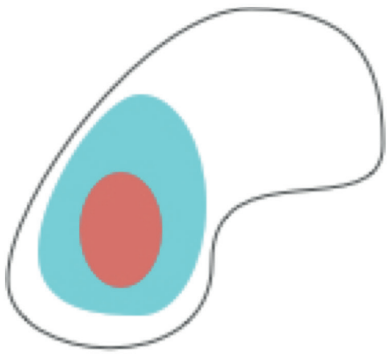

Fig. 10a *A region and its sub-regions*

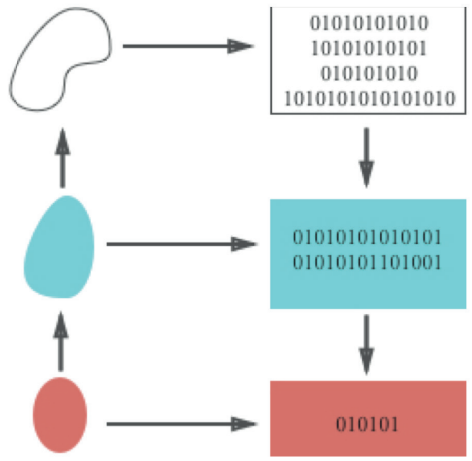

Fig. 10b *Inclusion of a space yields a restriction map (contravariance)*

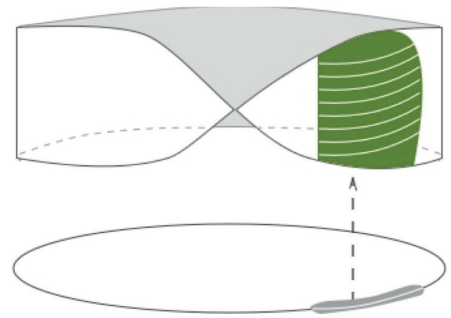

Fig. 8a *The presheaf of sections on a non-trivial bundle - the green region is assigned the white lines corresponding to cross-sections over S^1*

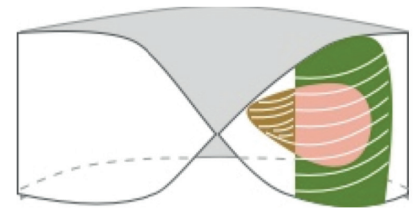

Fig. 8b *We can glue the green and brown regions as long as they agree on their overlap*

However, there is a slight problem. Sometimes, selecting two different regions produce the same data. Also, there is no way to combine two selections together in a determined way. This is what a sheaf provides. To move from a presheaf to a sheaf, we need to add the following two constraints:

1. Uniqueness - If two regions have the same data associated to them, they are the same region.
2. Gluing - Two regions can be glued together if the data associated to their intersection agree.

Taking these constraints together, a sheaf determines a unique, global **assignment** of data for a given space. This is especially useful in contexts where the space in question is not given beforehand, but must be assembled or approximated using computational methods. In intuitive terms again, the second condition gives us a third action: "gluing" two selections together forms a (unique) third selection. One can imagine this roughly as a puzzle where we do not yet have all the pieces, but if we guess an adequate space for the pieces we do have, we can be assured that these pieces belong to a unique construction (i.e. there are no extraneous or duplicate pieces).

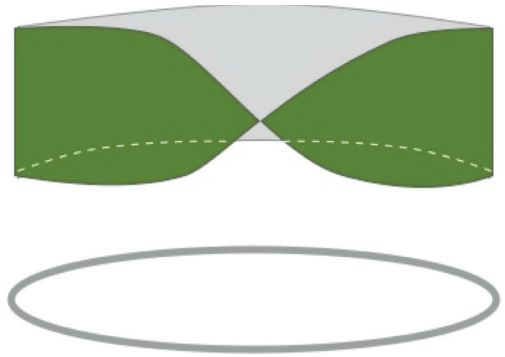

Fig. 8c *Extending the region to the entire circle, non-vanishing cross-sections disappear due to the non-orientable nature of the space.*

The sheaf therefore highlights the ways in which topological features may determine data. We call the examples in Fig. 8 a "sheaf of sections of a bundle", but sheaves may have any type of value. In the case of machine vision, the "base" is the image itself, the "bundle" the feature space of an image (e.g. its "redness" or its "circle-ness" arranged as linear bases), and the sheaf the assignment of values to the feature space. We can then formulate the question: what are the invariants of a space which limit its consistent assignments? Just as information in the

Einstein-Minkowski universe is bounded by the speed of light, the region of non-vanishing cross sections of a vector bundle can be "bounded" by its twist. These bounds are the invariants of the space which are generally unknown beforehand. From this (rather cursory) look at sheaves and the mathematics of assigning data to space, we can now attempt a broader claim regarding "cognitive mapping".

Price, Value, and Space

We tend to default to a *personal framework* when faced with world events and economic data. In this framework, events are caused by individuals consciously acting to achieve their goals. This inevitably paints phenomena in humanist and moral colors. With the rise of truly complex systems which govern our lives, perhaps it is time to also consider formal, a-cognitive methods. In the following, we offer nascent ideas for incorporating topology and computation into a map of the economy.

At the outset, it is important to denote the difference between price and value: whereas market prices are determined by exchange activity (i.e. supply and demand), value is determined by a hidden variable in the system. In Marx's theory, it is "abstract labor time", a socially determinate measure of labor needed to produce a given commodity. Whether there exists a formula to compute price from value is still unresolved. Yet, we know that such formula, if it were invertible, would trivialize Marx's project since it would mean that price and value represent the same thing. In our view, the discussion of the "transformation problem" can be made fruitful if we consider value as a space with topological properties. This would mean that a single variable (labor-time) is inadequate to capture this space. Marx's own solution to this problem involved introducing a variable representing the "organic composition" of capital[36]. Without entering the debate surrounding the coherence or validity of this approach, we can observe that it amounts to enlarging the space of value with additional variables that could explain the dynamism of prices (without thereby reducing value to price). However, as we have just introduced, we can study space independent of any chosen metrics. Let us consider then that value is comprised of open regions which can become "flattened" into prices. In other words, we assume that the space of value is inherently larger than that of prices.

36 See again Heinrich 2013 and the responses by Carchedi and Roberts 2013. In general, the debate surrounds the question of whether "the tendency of the rate of profit to fall" is a necessary component of Marx's theory.

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Accordingly, we can assign (or lift) prices into this larger space. Intuitively, commodities with vastly different properties can nevertheless have the same price. Yet, how does this assignment occur? When market activity takes place, prices take on logical constraints which are immanent to a given economic situation. This is usually modeled as a game where multiple players attempt to maximize their gain. Each game, provided certain conditions hold, yields one or more possible equilibrium points - those in which each player has found a strategy which cannot be improved upon. In the game of the market, the set of possible strategies consists of when to buy or sell commodities and at what prices. There can be markets within markets (which are not necessarily local to any region of the Earth), thus they can exhibit a nested structure similar to that of the open sets of a space. This process is supposed to converge to equilibrium levels as we go further up the chain. Intuitively, the convergence of prices is explained by the fact that any discrepancy for a given commodity between markets allows a player to profit (by buying low and selling high, for example). In this way, the market is a game which also behaves like a space. It follows that we have the ingredients to make a pre-sheaf, namely, one which assigns possible prices (corresponding to strategies).

The notion of an "efficient market" may be recast in terms of a sheaf. The uniqueness property tells us that every strategy has a determined payoff. The gluing property tells us that the various markets *agree* on the price of mutual commodities. These conditions then correspond to the thesis of converging prices and strategies. In the case where data does not fit the consistency criteria (gluing and uniqueness), mathematicians may use an algorithm called **sheafification** which modifies the assigned data to fit a sheaf. Accordingly, we can conceive the activity of the market as a machine for such sheafification of prices.

A price serves as a signal that a commodity may be over or under priced relative to some fixed imaginary price. Whoever "fixes" this inefficiency first makes a profit. Ideally, this leads to prices which are consistent across the global market at any given moment. We could call this the *Hayekian*[37] picture of how prices come to be and the function they serve. For Hayek, the market resembles an omni-intelligent force because it incorporates unsystematic, time-sensitive knowledge in its system of prices. By reacting immediately in a decentralized manner, the market can resolve coordination problems between various actors even in cases of total anonymity[38]. Yet, between the individuals "on the spot" and the

37 Hayek 1945

38 This is also the allure of cryptocurrencies, which promise to "free" money from its institutional shackles. The ideological underpinning of such movements can still be found in Hayek.

global convergence of prices, there is a whole series of intermediate unknowns, including firms and institutions, asymmetric information and power structures, etc. Furthermore, even though the market *can* extract useful signals from knowledge, it also inputs these signals back in - leading to the possibility of a nonlinear, non-equilibrium system. Due to this complexity, the reliability of the market to become efficient is taken as a given. This leads us back to the question of cognitive mapping. If we assume that the space of value is well-understood (where, for example, one can distinguish independent random variables), we can join Hayek in celebrating the miracle of price system. However, if this space is non-trivial, then we cannot trust that a sheaf of prices exists. This seems to be the case when we consider the role of credit in sustaining the system and the culpability of complex financial instruments in recent crises. Instead of thinking of the market as always in the process of converging to equilibrium, we should think of it as attempting to stave off crisis by producing its own formal means of consistency. By identifying the market as a continual process of sheafification, we may be able to computationally map this process and therefore find critical points of intervention. To do this, we have to shed our assumptions about convergence of prices and instead incorporate data generated by global crises.

What Hayek's approach misses is how the price system restructures the very knowledge that sustains it. This restructuring is generally taken as a form of progress - as technology improves, workers are freed to specialize, which gives rise to the "knowledge-class". This in turn leads to increased productivity as business firms transform under a confluence of different fields. However, knowledge is a form which inherently resists commodification. Attempts to create boundaries around it in order to make it rentable are transient, as it has (near-)zero reproduction cost. Businesses quickly adopt the latest technologies and automation techniques, and the outcome is that less workers are needed. The correlate to the knowledge class is therefore the transiently or permanently unemployed class.

In assigning prices to the space of value, human society achieves dynamic growth and coordination, but this process then transforms value itself. Along these lines, what if the value space has topological properties which prevent a *consistent global* assignment of prices? This is not simply asserting that conditions are never ideal due to external factors. It is asserting rather that the sheafifying process inherently fails because of factors which are not visible in local assignments (which may appear efficient after all). These topological factors only appear as **singularities**, or points where the sheaf of prices break down. In other

words, they would be "topological generators" of crises.

We should avoid the trap of moralizing the problems we face today. It is not greed, nor even negligence, which lead to crisis, but features of the system itself. Students of Marx should acknowledge capitalism as a complex machine, not as conspiracy or manifestation of evil. Non-Marxists should acknowledge the non-equilibrium nature of the market. And we should consider political-economic decisions as those which force a price-assignment that considers the entire space, rather than the local, profit-maximizing ones. This may include increasing benefits, education, etc. insofar as they are counted as part of the price of a laborer. Yet, we should view these decisions outside of the welfare-state context, that is, not simply as preserving a standard of life, but as producing a new space of value. The true metric for change is not simply one of "economic equality", which can be a red herring for real transformation, but forcing changes in what is invariant in the existing space. Answering to this would amount to a real map of politics into the economy.

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Bibliography

Carchedi, Guglielmo and Roberts, Michael 2013, "A Critique", Monthly Review, Commentary, online at: https://monthlyreview.org/commentary/critique-heinrichs-crisis-theory-law-tendency-profit-rate-fall-marxs-studies-1870s/

Curry, Justin 2017, *Sheaves, Cosheaves and Applications*, dissertation, available at: http://justinmcurry.com/research/

Dupuy, Jean-Pierre 2014, *Economy and the Future: A Crisis of Faith*, Michigan State University Press

Hatcher, Allen 2001, *Algebraic Topology*, Cambridge University Press. Available online at: https://www.math.cornell.edu/~hatcher/AT/AT.pdf

Hayek, Friedrich 1945, "The Use of Knowledge in Society", available online at: http://www.econlib.org/library/Essays/hykKnw1.html

Heinrich, Michael 2013 "Crisis Theory", Monthly Review, Vol. 64, Issue 11, online at: https://monthlyreview.org/2013/04/01/crisis-theory-the-law-of-the-tendency-of-the-profit-rate-to-fall-and-marxs-studies-in-the-1870s/

Jameson, Frederic 1992, *The Geopolitical Aeshetic*, Indiana University Press

Kant, Immanuel 1998, *Critique of Pure Reason*, Cambridge University

Karatani, Kojin 1995, *Architecture as Metaphor*, MIT Press

Kliman, A., Freeman, A., Potts, N., Gusev, A., and Cooney, B. 2013, "The Unmaking of Marx's Capital", available at SSRN: https://ssrn.com/abstract=2294134

Lawvere, William and Schanuel, Stephen 2009, *Conceptual Mathematics*, Cambridge University

Lynch, Kevin 1960, *The Image of the City*, MIT Press

Mac Lane, Saunders and Moerdijk, Ieke 1992, *Sheaves in Geometry and Logic*, Springer.

Marx, Karl 1992, *Capital: Volume 1*, Penguin Classics

Mclarty, Colin 2013, "The Rising Sea: Grothendieck on simplicity and generality", available online at: http://www.landsburg.com/grothendieck/mclarty1.pdf

Mendelson, Bert 1963, *Introduction to Topology*, Dover

Penrose, Roger 2004, *The Road to Reality*, Vintage Books

Piketty, Thomas 2014, *Capital in the Twenty-First Century*, Belknap Press

Reich, Robert 2015, *Saving Capitalism*, Bozoi Books

Saito, Kohei 2016, "Marx's Ecological Notebooks", Monthly Review, Vol. 67, Issue 9, online at: https://monthlyreview.org/2016/02/01/marxs-ecological-notebooks/

Toscano, Alberto and Kinkle, Jeff 2014, *Cartographies of the Absolute*, Zero Books

Tupinambá, Gabriel 2014, *Social Forms In Dialectical Materialism*, dissertation (publication forthcoming in Verso)

Žižek, Slavoj 2010, *Living in the End Times*, Verso

An Interview with Catherine Malabou: Toward Epigenetic Philosophy

Frank Ruda & Agon Hamza

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C&C: Let us begin with what is perhaps a classical question on the relation between philosophy and science. Philosophy throughout its history and from its very beginning –seems to have (had) an intimate, yet intricate relation to science and scientificity. Some philosophers have argued that the very emergence of mathematics proved to be a constitutive reason for the emergence of philosophy itself (we can think of Althusser). According to others, the history of philosophy is fundamentally made of the failed attempts to constitute itself as a science in its own right (one can here think of Kant's famous claims in his first Critique, or Hegel, Husserl and others). What role would you assign to science at and for the very beginning and origin of philosophy? Is there a particular science which you would single out in its importance, a role for which mathematics may always have been a good candidate (maybe there are even different sciences that prove to play such a role historically)?

C.M. I think that the "classical question" on the relation between philosophy and science can be approached from three distinct angles, that do not have the same aim. First, from the *history of science* angle, second the *epistemological* angle, third from the *metaphysical* angle. History of science studies the constitution of the different fields of scientific knowledge according to the cultural criteria of a given historical period. This includes mentalities, religious and ideological context, as well as the level of technological development of a given civilization. From that perspective, it is clear that the development of Greek mathematics and physics cannot be studied separately from that of philosophy. Such a study though does not seek to bring to light the foundational moment of these disciplines, that is their grounding principles. History of science is descriptive and non-normative, even if a genuinely good and helpful history of science cannot of course only be a narrative. Still, the "transcendental" perspective is absent from it.

The epistemological angle looks in three directions at the same time: first, it determines the constitution of the proper rationality inherent to each field, that is the specific conditions of its autonomy. Second, it studies its history and evolution, not in the sense of the aforementioned history of science point of view, but from the perspective of the construction of its internal truth and validity. Bachelard remains a model of that type of inquiry. He brought to light the idea that scientific progress is dialectical, that each new break out in the history of a particular science is a "no" to the previous one. For example, Lavoisier's chemistry is a "no" opposed to alchemy (*See La Philosophie du Non*). Epistemology is also, thirdly, a study of the scientific mind (esprit scientifique), that supposes the distinction between reason, opinion, and belief (see also Bachelard, *La Formation de l'esprit scientifique)*.

Now, what about the metaphysical approach? It is of course

all contained in the prefix "meta". Since Plato as we know, who however did not know the term metaphysics, philosophy has appeared as the knowledge of the first principles of every domain of rationality. Mathematics are still using "hypotheses", as Socrates explains in the *Republic*, that is conditioned postulates, involving some empirical and sensuous elements, rather than philosophy (or "dialectics") reasons out of pure idealization. I think this has remained true from Plato to Husserl, inspite of changes in method and definitions of the rational, and the passage from ideas to transcendental "idealities".

Two radical breaks with such a vision appear 1) with analytic philosophy on the one hand, 2) with Heidegger in the continental European tradition. 1) Analytic philosophical approach proposes a definition of truth that pertains neither to history, epistemology and metaphysics. Propositional and modal logic, and is from that point of view, the linchpin between philosophy of science. 2) Heidegger on his side, against both analytic philosophers and philosophers like Cohen or Cassirer, claims for an autonomy of metaphysics, and consequently also of philosophy, from the scientific domain. More exactly, the task of philosophy is not to provide for the foundational apparatus of science any longer. Its task is not historical or epistemological either. It consists in bringing to light what the traditional relationship between metaphysics and science has precisely dismissed and occulted, namely the definition and understanding of truth, not as "*adequatio*" but as "*aletheia*" or disclosure as Being. As we know, this break through started for an important part with the brilliant reading of Husserl 6th *Logic Research* and the "categorial intuition", in which Heidegger shows that the important point in a proposition, an axiom, or a principle, is the value of the copula, of the *is*.

After Heidegger, the movement of deconstruction of metaphysics and *episteme* has become always more radical, as obvious in Derrida. Philosophers like Foucault are much more attentive to history of science and epistemology, but their main preoccupation is to situate the emergence and intentionalities of human sciences, like linguistics or psychology, and exhibit the biopolitical content of disciplines like biology or medicine, without touching mathematics of physics. Along with these moves, the philosophical discourse also changes. Derrida, Foucault, Deleuze, to name but a few, engage a profound reflection on the relationship between philosophy and literature, that deeply modifies the language of philosophy.

Such changes of orientation have occurred in parallel with the explosion of the unity of science itself and its fragmentation in a plurality of fields irreducible to unity. The analogy of the "line" developed by Plato where each particular science finds itself situated in a hierarchy has of course become definitely obsolete.

C&C: You argue that we should conceive of the rupture that happened in and with modern science as a total break with previous ideas of science or is there a continuity between the Greek and the modern worlds? Or is there rather a far-reaching transformation of something that is constitutive of scientific practice, so a transformation from below (as Jean-Claude Milner once argued that it is not that there is for example mathematization that emerges with modern science but that the very mathematical medium itself attains a different ontological status in modern science)? And if there is either what does this mean to do philosophy, even under changed historical or unchanging rather structural conditions?

C.M. Let me first turn toward the last part of your previous question, concerning the status of mathematics. As I just said, I am more in favor of break rather than continuity, even if both break and continuity have to be approached with care and caution (it is never as simple as "either/or"). Again, the dialectical model proposed by Bachelard is certainly the most satisfying when it comes to determine the value of transformations within a given scientific corpus. Transformation is always both a modification of the same form, and the emergence of a radical new form, what I have tried to conceptualize with "my" concept of plasticity. I don't see why mathematics would escape this schema and line of development.

I am extremely doubtful about what I would call the current dogmatic ontologization of mathematics. I certainly respect Milner's or Badiou's mathematical knowledge and skill. This said, no mathematical knowledge and skill should give way to the kind of sacralization of mathematical ideas that we are witnessing today.

I just said that continuity and rupture are always intertwined in a dialectical relationship. This is of course also valid for philosophy. If there is a new break today — that I will analyze further— with the deconstructive visions of the relationships between philosophy and science, there must be also a continuity with them! Many contemporary philosophers seem totally oblivious of deconstruction, which is ridiculous and dangerous, because there will of course and necessarily be a return of the repressed!!! The questions that should be addressed are, to name but a few: why still confer a privilege to mathematics today ? What is the legitimacy of such a gesture? What to do for example with current neurobiological assumptions according to which there are no mathematical essences, only adaptive truths (what is true is what is most beneficial), no a priori principles, etc? Mostly, what is the meaning of the current secret and insidious philosophical trend that tends, through the sacralization of mathematics, to reestablish the authority of metaphysics? As if nothing had happened in between Husserl's time and ours?

C&C: The very relation between philosophy and science – if there is one at all – raises profound questions for the practice of both, such as: What is the material status and what are the material effects of scientific knowledge for philosophy? Does philosophy need to integrate, mimic, repeat and maybe repeat but also transform scientific practice, that is: its proceedings, techniques, its knowledge in its very own form of practice? Is science about knowledge after all? And would as science not of knowledge but of truth just be another name for philosophy?

C.M. How can you say "if there is one at all"? Not only there is one, but this issue has been constantly orienting every philosophical practice since the beginning, even under the apparent contradictory form of its deconstruction. One of Derrida's most important text, is it necessary to remind the reader of this, is his preface to Husserl's *Origin of Geometry*. Be it in the form of an union, a cooperation, a hierarchization, a clarification or a divorce, philosophy cannot sustain itself without determining its own situation vis a vis science, and this has nothing to do with a mimicking. This is reciprocal, as sciences, be they "hard" or "human", cannot but proceed from principles that contain concepts that have to be philosophically interrogated to the extent that they are not entirely objective, empirical or positive. Hence the concept of epigenesis at the heart of epigenetics, the concept of code at the heart of genetics, the concept of the aleatory in physics, the concept of transfinite in mathematics, etc. It is definitely criminal to not introduce philosophy classes in scientific departments, and no genuine question of the meaning of scientificity of science in philosophy departments. This fosters an intolerable ignorance and blindness on both sides. Many of my colleagues philosophers don't have a single clue about the current neurobiological revolution for example. To answer the last part of your question, yes, of course, science and philosophy constantly transform each other, modify their practices and orientations accordingly. How can we think that what is currently going on in neurology is not preparing a new definition of intelligence, spirit and the act of thinking? In reverse, how can neuroscientists deafen themselves to the necessary work of critique? What is a neurobiology with is not a critical neurobiology? We need a critique of neurobiological reason, we need a critical neuroscience, as well as a new modality of critique informed by neuroscience.

Truth does not belong to one or the other, to philosophy or science, but emerges from their interactions and conflicts.

C&C: Would you think or contend that scientificity is a general standard for thinking? If so, what to do with the revolutions or at least fundamental transformations that took place in the sciences (including for example the so called foundational crisis in mathematics and maybe could sometimes even be described as inventions of new forms science, etc.)? Or, if not, what kind of concept of science can one – the scientist or the philosopher, or the latter or former as both – have?

C.M. I never said that "scientificity was a general standard for thinking", for many reasons, but also for the very simple one that when someone uses a general standard as a principle of thinking, thinking disappears... The 20th century, it is true, had to deal with a severe challenging of foundations and grounding. The unifying principles of physics notably were thrown into question. The principle of conservation of energy, the principle of entropy, the principle of conservation of mass, etc, all of them were confronted with great difficulties. French mathematician Poincaré had little confidence in the nature of principles: they were constructed by physicists because they accommodate and take into account a large number of laws. Their objective value consists in forming a scientific convention, in other words in providing a firm foundation to the basis on which truth and falsehood (in the scientific meaning of the words) are separated. This demonstrates that truth and falsehood "the axioms of geometry are only definitions in disguise. What, then, are we to think of the question, Is Eucledian geometry true? It has no meaning. We might as well ask if the metric system is true, and if the old weights and measures are false... One geometry cannot be more true than another ; it can only be more convenient."

By this, Poincaré does not mean that truth is a mere convention. In that sense, philosophy and science have something in common, which is that no new philosophy is more "true" than a previous one. Both philosophy and phsycis for example concid with the dialectical movement of their own truth. Poincaré means that truth and falsehood are a matter of experiment. Experiment alone can challenge a principle. Experiment alone can foster the expression of a new principle. One might argue that this is the main difference between physics and philosophy. I am not so sure though. A philosophy that does not have a serious, rigorous experimental side, is not a philosophy. I know I will shock some of my readers, but I think this is also true for mathematics. Of course, we play here with different meanings of "principle" and "experiment".

C&C : In "What Should We Do with Our Brain?", you seem to suggest a renewal of ideology critique, if we are not misreading you: we live in a world in which we are constantly described, addressed and even interpellated to be flexible. Yet, what science tells us that we are essentially plastic – that is not only form receiving, but form giving – beings. This insight itself or as such is not yet political or politicized. It is a scientific claim. But if philosophy, that is in your case, you, takes up this scientifically provable statement it gains a political value if it is pitched against the ideology of flexibility: first we see that it is an ideology (an imaginary

representation of our real, plastic, conditions of existence) and second that it is an ideology which misrepresents what we are. So, we fell prey to a misunderstanding of ourselves. Science can clarify, can tells us more about ourselves, more about what we are, what we can do and thus we can only and for the first time truly raise the question what to do with what we are. And, it seems the task of philosophy in relating to science is, at least in the case, a fundamentally political one. Do you think that political question emerge within the very relation of the two (and the impact this can generate on not only how we understand the world but ourselves)?

C.M. The brain has always had a political signification, metaphorical perhaps, but still extremely pregnant. When you say of someone that this person is a brain, it refers to power. The brain is the organ of command, as you can also hear literally in the word cybernetics. I have argued in *What Should We Do With Our Brain* that this structure of command has changed. Instead of being a centralized organ of government, the brain now appears, in the light of the recent scientific discoveries, as a decentralized system, made of different points in a network that constantly interact but are not gathered in a single locus. The name of such a structure is "plastic organization". It is striking to see how current capitalist management has used such a structure for its own sake by calling it "flexible" instead, thus inducing that all points in a network (meaning all individuals involved in a labour process) are mobile, easily displaceable and exploitable. The issue of flexibility of labour is central in all economically advanced societies today. The substitution of flexibility for plasticity erases the notion of resistance. A plastic material is malleable, but resists deformation once shaped, like the marble that has become a sculpture. You are right to say that this flexibility/plasticity dialectics also concerns the vision that we have of ourselves. We do have to set up what our thresholds of resistance are in a world in which these thresholds are constantly blurred and denied. Undoubtedly, the brain is the main organ for such a resistance, it suffers from all transgressions of these thresholds (burn out phenomena, traumas, depression...) and that makes it difficult for us to know exactly what to do because the brain is invisible and its language has not yet been deciphered. Such a decoding process should be the task of psychoanalysis or neuro-psychoanalysis to come.

C&C: Currently new, especially philosophical positions emerged that all seem to concur about offering an adequate or more solid conceptualization of the relation between philosophy and science that seeks to overcome Heideggerian technology critique as well as what classically was addressed as mere positivism of science (inter alia in the tradition of the Frankfurt school and the like). We are thinking of phenomena that became prominent under labels (that almost no one seems to like but everybody nonetheless uses) such a speculative realism or related strands as "accelerationism". Would you be willing to give us a short "cognitive map" of the current situation as you see it and how you would situate yourself in it?

C.M. It is very clear that all interesting philosophical propositions today tend to break with the famous Heideggerian "Wissenshaft denkt nicht" proposition. Continental philosophy has been way behind scientific progress since at least fifty years and that is a shame. The critique of "positivism" has been a lazy pretext for ignoring the most important scientific discoveries of our time, and consequently also dismissing their philosophical impact.

To sketch the current "cognitive map" drawn by new philosophical approaches of the problem, I see four main trends or directions. First the mathematical trend, opened by Badiou and followed up by Meillassoux and his insistence on the transfinite in order to reelaborate the concept of contingency. Second, the new path opened by philosophy and physics: the materialist trend followed by people like Karen Barad or Jane Bennett (*Vibrant Matter*). Third the biological path with an insistence on epigenetics that I am myself following, and fourth what I would call the philosophy of the technopole, that includes reflections on digital technologies, IA, data science, accelerationism (Kittler, Stiegler, Land, ...).

C&C: You recently published a book on epigenesis. What got you into returning to this category or maybe rather question that as you show also occupied Kant (especially the Kant of the third Critique)?

C.M. What gave me the incentive to write *Before Tomorrow* was speculative realism's rejection of all notion of transcendental. Speculative realism is an umbrella term, that subsumes many trends, even the OOO (Object Oriented Ontology) ones, but all of them share the same rejection of the transcendental, that is first of all of Kant's philosophy, and the hegemony of criticism that for a long time has appeared as the only way to deal with metaphysical problems.

Before Tomorrow is for an essential part an answer to Meillassoux's challenge: "The primary condition to the issue I intend to deal with here is the relinquishing of transcendentalism". The transcendental is a logical barrier that is set up against the radical contingency of the world. The set of *a priori* laws, principles and categories brought to light in the *Critique of pure Reason* is supposed to guarantee the physical necessity and regularity of the world, according to well-known Kantian principle that the laws of nature are identical with the laws of our understanding. In reality, as Meillassoux argues, Kant was never able to deduce the transcendental, only to posit it. In that sense, the transcendental is itself contingent. Its only basis is the subject/object correlation. This correlation itself, correlation-

ism in general, is a very frail basis. How is it possible to advocate for the necessity of the world on such a ground, that cannot account for the nature of a world from which humanity is absent, and only deals with the finitude of our cognitive apparatus?

Reading Meillassoux made me aware of other attacks on the transcendental, coming from very different contexts, like Heidegger's, Foucault's philosophy, along with a whole range of continental philosophers. But also, in a radically different tradition, from contemporary neurobiologists.

The reasons for these attacks are of course different, but they all converge on one point: the transcendental is a rigid structure, that is not able to ground itself. Neurobiologists argue, following neo-Darwinian arguments, that what we currently consider *a priori* knowledge is only a result of a long evolution. It was an *a posteriori* acquisition in the first place, for our ancestors, that became *a priori* for us because it has been assimilated, simplified, and mastered.

My problem was not to save Kant by all means from these accusations, but simply to ask myself: to what extent can we philosophize without something like a transcendental structure, that is something that belongs to thinking only and cannot be derived from experience, time or history ?

I wanted to demonstrate that this element of pure thinking, pure logic, was not necessarily fixed and immutable, and I drew the energy of such a demonstration in what Kant says in paragraph 27 of the first *Critique* when it comes to the deduction of categories. The categories are not innate, they are not derived from experience either, they are produced out of an epigenesis. Kant says "as it were, a system of epigenesis of pure reason".

It meant that there existed a space of transformability within the transcendantal. Such a space is clearly explored in the third *Critique* with the analysis of teleology, biology and the living being. It is the space of life. I also argued that the third Critique had a retroactive transformative effect on the first one. This epigenetic effect constitutes the genuine deduction of the transcendental.

C&C: You added or coined a new term, which in your conceptualization, serves as a kind of additional, fourth element to the famous Lacanian triad (Real, Imaginary and Symbolic). You call this the *material*. This concept is informed by neurobiology, according to which a trauma or "new wounds" (brain damages, wounds, injuries) cannot be properly accounted for by psychoanalysis or at least according to their most influential model (Freud, Lacan). Neurobiological traumas are, in your understanding, exceed what Freud described as the dimension *beyond the pleasure principle* – since, as you claim, it is beyond that the Freudian 'beyond'. In this sense, you make a distinction between, we might say, material and psychic wounds. So, in your debate with Freudo-Lacanians, you emphasize the distinction between the materialist unconscious and the libidinal unconscious. You privilege the former, on the basis of which you unfold your theory of subjectivity (which is done though Hegelian reading of cognitive sciences) – maybe epitomized in your comments about the Alzheimer patients who clearly cannot be treated by psychoanalysis anymore What precisely follows for you from the analysis of what you perceive as conceptual limitations of psychoanalysis? For the relation to science but also for the account of subjectivity (and maybe even for politics)?

C.M. Let me explain the basis of my approach to trauma. It started with an inquiry about Freud's notion of plasticity. Plasticity, for Freud, characterizes the indestructibility of our earliest psychic formations. This idea appears very in *Thoughts For The Times On War And Death*. In the development of the mind, Freud states, "every earlier stage persists alongside the later stage which has arisen from it; here succession also involves co-existence, although it is to the same materials that the whole series of transformations has applied. The earlier mental stage may not have manifested itself for years, but none the less it is so far present that it may at any time again become the mode of expression of the forces in the mind, and indeed the only one, as though all later developments had been annulled or undone. This extraordinary plasticity of mental developments is not unrestricted as regards directions; it may be described as a special capacity for involution — for regression — since it may well happen that a later and higher state of development, once abandoned, cannot be reached again. But the primitive stages can always be re-established ; the primitive mind is, in the fullest meaning of the word, imperishable."[1]

The "extraordinary plasticity" of mental developments is thus linked with the permanence of the form. Once formed, the psychic matter cannot go back to its previous state. We must remember that the word "plasticity" generally describes the nature of that which is plastic, being at once capable of receiving and of giving form. The psyche is plastic to the extent that it can receive the imprint and impose this earlier form upon most recent developments. But we also know that plasticity equally means the power to annihilate form. Plasticity may be used to describe the crystallization of form as well as the destruction of all form (as suggested by the term "plastic" for the bomb).

The impossibility of erasure or disappearance in mental life expresses equally the liveliness of the trace (the persistance of the form) as well as the inertia proper to the death drive (the destruction of the form). That is what appears in mental diseases: "What are called mental diseases inevitably produces an impression in the layman that intellectual and mental life have been destroyed. In reality,

1 Freud 1957, pp. 285-286.

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the destruction only applies to later acquisitions and developments. The essence of mental disease lies in a return to earlier states of affective life and functioning."[2]

The impossibility of oblivion coincides with the inability to change, with the tendency to restore an earlier state of things, and with the deadly mechanism of the compulsion to repeat. We remember this passage from *Beyond the Pleasure Principle* in which Freud declares: "The elementary living entity would from its very beginning have had no wish to change ; if conditions remained the same, it would do no more than constantly repeat the same course of life. (...) Every modification which is thus imposed upon the course of the organism's life is accepted by the conservative organic instinct and stored up for further repetition. Those instincts are therefore bound to give a deceptive appearance of being forces tending towards change and progress, whilst in fact they are merely seeking to reach an ancient goal by paths alike old and new."[3] To say that the primitive mind is imperishable means both that the originary form of the psyche resists death and that it is the very expression of death. Preservation is thus the mark of vitality as well as the characteristic of inorganic passivity.

The "extraordinary plasticity" of mental developments thus maintains the psyche between life and death, between the emergence and the destruction of form.

The interaction between life and death is then definitely plastic.

As I said, though, Freud seems to have a different view on that same interaction. Let's go back to the play between life drives and the death drive. In *Beyond the Pleasure principle*, Freud invokes Hering's theory. "According to E. Hering's theory, two kinds of processes are constantly at work in living substance, operating in contrary directions, one constructive or assimilatory and the other destructive or dissimilatory. (...) We venture to recognize in these two directions taken by the vital processes the activity of our two instinctual impulses, the life instincts and the death instincts."[4]

Eros, or the life drive, creates forms. The death drive destroys them. But this time, and this is what is very interesting for me, Freud declares that only the life drives are plastic, and he regards the death drive as elastic.

But, and such is the problem, if we closely read *Beyond the Pleasure Principle*, we discover that only the life drives are eventually said to be plastic. The destructive tendency, the compulsion to repeat, the restoration of an earlier state of things are eventually driven out the field of plasticity.

It is noticeable that Freud never uses the words "plastic" or "plasticity" to characterize the work of the death drive. In *Beyond the Pleasure Principle,* the death drive appears as "a kind of organic elasticity, or, to put it in another way, the expression of inertia inherent in organic life."[5] Instead of a fascinating face to face between creative plasticity and destructive plasticity within the compulsion to repeat, we find a disappointing contrast between plasticity and elasticity. Life creates forms, death is a formless return to matter. Death is a levelling of all forms. A trauma does not create a psychic form.

Freud states however that the profound meaning of the death drive is the immanence of death to life. Death is not, or not only, an external threat, but it works within life. It means that life forms its own destruction: "The organism only wishes to die in its own fashion."[6] The organism forms its own death. The return to inorganic matter is paradoxically the result of a formative process which is the formation of the organism's own death. But Freud curiously does not succeed in characterizing this formative or fashioning process. He never gives an example of it. Destructive plasticity is once again reduced to elasticity, that is to the formless and traceless return to the origin. There is eventually no plastic work of the death drive. There are no *forms of destruction*. The destructive instinct are not plastic at all.

If we are not able to prove that the destruction of form has and is a form, if form is always on the side of Eros and of pleasure, it becomes impossible to prove that there is anything beyond the pleasure principle.

This is what I explained in *The New Wounded.* I argue about the "plasticity of the wound", in which every "destruction is a form that forms." "All suffering is formative of the identity that endures it".

C&C: Léon Chertok and Isabelle Stengers co-authored a book, which in English is translated as a critique of psychoanalytic reason. It seems to us that the book takes the que from Chertok's thesis that psychoanalysis neglected hypnosis. They grant Freud the attempt of constructing a *science* in a domain which is that of irrationality: of desires, attitudes, complaints, and so on. According to them, "the "psychoanalytic reason" invented by Freud – that is, the articulation between psychoanalytic theory and practice – does not simply reproduce the model of other rational practices." Accordingly, Chertok and Stengers argue that the uniqueness of Freud relies on the fact that he operated under two imperatives: a) he created a practice which did not limit the making 'heart' just an object of science like any other, but it is far more complex, and b) he created a practice which attempts to understand and address the obstacles the heart poses to reason. Interestingly, they seem to agree with Althusser, who maintained that Freud's invention was of scientific nature. What place do you grant psychoanalysis? Is it a scientific discipline, or merely a theoretical orientation?

2 . *Ibid.*

3 Freud 1999, p. 38.

4 Ibid., p. 49.

5 Freud, p. 36.

6 Ibid., p.39.

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C.M. We should be careful in distinguishing at least three approaches to the problem of the "scientificity" of psychoanalysis. First, that of the enemies of psychoanalysis: psychoanalysis is not a science because its results cannot be proved, and thus it does not answer the criteria of falsifiability (Popper). Second, that of Freud. I think of the famous passage of *Metapsychology* that affirms that yes, contrarily to what many people think, psychoanalysis is a scientific theory to the extent that the "hypothesis of the existence of the unconscious" has several empirical manifestations that can easily turned into proofs. Such a debate remains at the level of objectivity and objectification. A third approach is the Lacanian one, that displaces the problem from objectification to subjectification. Let me quote Bruce Finsk's excellent analysis on that point:

"But is that the kind of scientificity [the 'objective' one] that psychoanalysis can hope to achieve or even wish to achieve? The *APA Monitor*, the main organ of the American Psychological Association, occasionally lists which aspects of Freud's theories have been borne out by empirical research: of course, when we consider what they have reduced Freud's theories to in order to test them, and then examine the research design they have come up with to test such watered-down theories, we may well wonder whether the supposed confirmations are of any more value than the alleged refutations!"[7] According to Lacan, this is not at all the kind of scientificity at which psychoanalysis must aim: to his mind, psychoanalysis is not currently a science, and it is not by going in that direction that it will become one. "It is not what is measured in science that is important, contrary to what people think".[8] Psychoanalysis is not a science if we hear by that a mode of objective validation, but it still promotes a concept of truth if by this we mean what makes sense for a subject. And this cannot be "measured", only interpreted. It seems difficult to me to go beyond Lacan's contention on that point. I don't think it reduces psychoanalysis to a "theoretical orientation" only, but more generally and ambitiously, it defines it as a science that resists its own categorization as a science precisely. What in science escapes science, that is its subjective side.

Berlin/Paris/Prishtina
February 2018

7 Fink 2004, p.127

8 Lacan 1999, pp116-128

Bibliography:

Bachelard, Gaston 1993, *La Formation de l'esprit scientifique*, Paris: Vrin

---------- 2012, *La Philosophie du Non*, Paris: PUF

Bennet, Jane 2009, *Vibrant Matter: A Political Ecology of Things*, Durham: Duke University Press

Cherton, Léon & Strengers, Isabelle 1992, *A Critique of Psychoanalytic Reason: Hypnosis as a Scientific Problem from Lavoisier to Lacan*, Stanford: Stanford University Press

Derrida, Jacques 1989, *Edmund Husserl's Origin's of Geometry: An Introduction*, Nebraska: University of Nebraska Press

Fink, Bruce 2004, *Lacan to the Letter: Reading Écrits Closely*, Minneapolis/London: University of Minnesota Press

Freud, Sigmund 1957, "Thoughts For The Times On War And Death", in *On The History of Psycho-Analytic Movement and Other Works*, London: The Hogarth Press

---------- 1990, *Beyond the Pleasure Principle*, New York: W.W. Norton & Company

Lacan, Jacques 1999, *The Seminar of Jacques Lacan: On Feminine Sexuality, The Limits of Love and Knowledge (Encore)*, New York: W.W. Norton & Company

Malabou, Catherine 2008, *What Should We Do with Our Brain?*, New York: Fordham University Press

---------- 2012, *The New Wounded: From Neurosis to Brain Damage*, New York: Fordham University Press

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